# B.Sc. PHYSICS

**SYLLABUS - 2017**

**SCHOOLS OF EXCELLENCE**
**with**
**CHOICE BASED CREDIT SYSTEM (CBCS)**


**SCHOOL OF PHYSICAL SCIENCES**
**St. JOSEPH'S COLLEGE (Autonomous)**
Special Heritage Status Awarded by UGC
Accredited at 'A' Grade (3rd cycle) by NAAC
College with Potential for Excellence Conferred by UGC
DBT-STAR & DST-FIST Sponsored College
**TIRUCHIRAPPALLI - 620 002, INDIA**

# SCHOOLS OF EXCELLENCE
# WITH CHOICE BASED CREDIT SYSTEM
# (CBCS)

## UNDERGRADUATE COURSES

St. Joseph's College (Autonomous), a pioneer in higher education in India, strives to work towards the academic excellence. In this regard, it has initiated the implementation of five "Schools of Excellence" from the academic year 2014 – 15, to standup to the challenges of the 21st century.

Each School integrates related disciplines under one roof. The school system allows the enhanced academic mobility and enriched employability of the students. At the same time this system preserves the identity, autonomy and uniqueness of every department and reinforces their efforts to be student centric in curriculum designing and skill imparting. These five schools will work concertedly to achieve and accomplish the following objectives:

- Optimal utilization of resources both human and material for the academic flexibility leading to excellence.
- Students experience or enjoy their choice of courses and credits for their horizontal mobility.
- The existing curricular structure as specified by TANSCHE and other higher educational institutions facilitate the Credit-Transfer Across the Disciplines (CTAD) - a uniqueness of the choice based credit system.
- Human excellence in specialized areas
- Thrust in internship and / or projects as a lead towards research and
- The multi-discipline nature of the newly evolved structure (School System) caters to the needs of stake-holders, especially the employers.

### What is Credit system?

Weightage to a course is given in relation to the hours assigned for the course. Generally one hour per week has one credit. For viability and conformity to the guidelines credits are awarded irrespective of the teaching hours. The following Table shows the correlation between credits and hours. However, there could be some flexibility because of practicals, field visits, tutorials and nature of project work.

For UG courses, a student must earn a minimum of 150 credits as mentioned in the table below. The total number of minimum courses offered by a department are given in the course pattern.



## SUMMARY OF HOURS AND CREDITS
## UG COURSES

| Part | Semester | Specification | No. of Courses | Hours | Credits | Total Credits |
|---|---|---|---|---|---|---|
| I | I-IV | **Languages** (Tamil/Hindi/French/Sanskrit) | 4 | 16 | 12 | **12** |
| II | I-IV | **General English** | 4 | 20 | 12 | **12** |
| III | I-VI | **Core** | | | | |
| | | Theory | 11-16 | | | |
| | | Practicals | 3-6 | | | |
| | V-VI | Project Work | 1 | 90 | 60 | |
| | IV-VI | **Core Electives** | 3 | 12 | 12 | |
| | V | Self-paced Learning (Partial Online Course) | 1 | - | 2 | |
| | VI | Comprehensive Examination | 1 | - | 2 | |
| | I-VI | **Allied** | 4/6 | 24 | 20 | |
| | III & V | **Extra Credit Courses** | **2** | **-** | **(4)** | |
| | VI | **Internship** | 1 | - | 2 | **98** |
| 1V | | **Skilled Based Electives:** | | | | |
| | V | Between Schools (BS) | 1 | 2 | 2 | |
| | VI | Within School (WS) | 1 | 2 | 2 | |
| | V | **Inter Departmental Courses (IDC)** Soft Skills / NCC | 1 | 2 | 2 | |
| | | **Non-Major Courses (NMC)** | | | | |
| | I | Communicative English | 1 | - | 5 | |
| | II | Computer Literacy | 1 | 2 | 2 | |
| | III | Environmental Studies (Partial Online Course) | 1 | 2 | 2 | |
| | I-IV | **Value Education** | 4 | 8 | 8 | **23** |
| V | I-V | **SHEPHERD & Gender Studies** | - | - | | |
| | I-V | **AICUF, Fine Arts, Nature Club, NCC, NSS** | - | - | - | |
| | V | **Career Guidance & Training** | **-** | **-** | **-** | **5** |
| | | **TOTAL** | | **180** | **150** | **150 (+4 extra credits)** |

### Course Pattern

The Undergraduate degree course consists of five vital components. They are as follows:

Part -I : Languages (Tamil / Hindi / French / Sanskrit)
Part-II : General English
Part-III : Core Course (Theory, Practical, Core Electives, Allied, Project, Internship and Comprehensive Examinations)
Part-IV : SBE, NMC, Value Education, Soft Skills/National Cadet Corps and Environmental Studies (EVS)
Part-V : Community Service (SHEPHERD) and Gender Studies, AICUF, Fine Arts, Nature Club, NCC, NSS, etc.

**Non-Major Courses (NMC)**

There are three NMC's – Communicative English, Computer Literacy and Environmental Studies offered in the I, II & III Semesters respectively.

**Extra Credit Courses**

In order to facilitate the students gaining extra credits, the extra credit courses are given. There are two extra credit courses – Massive Open Online Courses (MOOC) and Skill-based Course – offered in the III and V Semesters respectively.

According to the guidelines of UGC, the students are encouraged to avail this option of enriching by enrolling themselves in the MOOC provided by various portals such as SWAYAM, NPTEL, etc. Skill based course is offered by the department apart from their regular class hours.

**Value Education Courses**

There are four courses offered in the first four semesters for the First & Second UG students.

**Non-Major Elective / Skill Based Elective**

These courses are offered in two perspectives as electives "Within School" (WS) and "Between School" (BS).

**Subject Code Fixation**

The following code system (11 characters) is adopted for Under Graduate courses:

| Year of Revision | UG Code of the Dept | Semester | Specification of the Part | Subject Category | Running no. in that part |
|---|---|---|---|---|---|
| ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 17 | U## | *x* | *x* | *xx* | *xx* |
| **17** | **UPH** | **1** | **3** | **2** | **1** |

***For Example*** :

I B.Sc. Physics, first semester **Mechanics and Properties of Matter**
The code of the paper is 17UPH130201.
Thus, the subject code is fixed for other subjects.



**Subject Category**

00 - Languages (Tamil / Hindi / French / Sanskrit)
01 - General English
02 - Core (Theory, Practical, Comprehensive Exams, Internship and Project)
03 - Core Electives
04 - Allied
05 - Extra Credit Courses
06 - Skill Based Electives (BS) & (WS)
07 - Soft Skill
08 - NMC (Communicative English, Computer Literacy/SAP)
09 - EVS (Environmental Studies)
10 - Value Education
11 - Community Service (SHEPHERD) and Gender Studies
12 - AICUF / Nature Club / Fine Arts / NCC / NSS etc.

**EXAMINATION: Continuous Internal Assessment (CIA)**

| **UG - Distribution of CIA Marks** | |
|---|---|
| **Passing Minimum: 40 Marks** | |
| Library Referencing | 5 |
| 3 Components | 35 |
| Mid-Semester Test | 30 |
| End-Semester Test | 30 |
| **CIA** | **100** |

**MID-SEM & END–SEM TEST**

Centralised – Conducted by the office of COE

1. Mid-Sem Test & End-Sem Test: (2 Hours each); will have Objective + Descriptive elements; with the existing question pattern PART-A, PART-B, and PART-C.
2. CIA Component III for UG & PG will be of 15 marks and compulsorily objective multiple choice question type.
3. The CIA Component III must be conducted by the department / faculty concerned at a suitable computer centres.
4. The 10 marks of Part-A of Mid-Sem and End-Sem Tests will comprise only: **Objective Multiple Choice Questions**; **True / False**; and **Fill-in the Blanks**.
5. The number of hours for the 5 marks allotted for Library Referencing work would be 30 hours per semester. The marks scored out of 5 will be given to all the courses of the semester.
6. English Composition once a fortnight will form one of the components for UG General English.

**SEMESTER EXAMINATION**

Testing with Objective and Descriptive questions

**Part-A: Objective MCQs only (30 Marks)**

Answers are to be marked on OMR score-sheet. The OMR score-sheets will be supplied along with the Main Answer Book. 40 minutes after the start of the examination the OMR score-sheets will be collected

**Part-B & C: Descriptive (70 Marks )**

**Part-B:** 5 x 5 = 25 marks (Inbuilt Choice);
**Part-C**: 3 x 15 = 45 marks; 3 out of 5 questions (Open Choice).

**The Accounts Paper of Commerce will have**
**Part-A**: Objective = 25
**Part-B**: Descriptive 3 x 25 = 75 marks.

**Duration of Examination must be rational;** proportional to teaching hours 90 minute-examination / 50 Marks for courses of 2/3 hours/week (all Part IV UG Courses) 3-hours examination for courses of 4-6 hours/week.

**Grading System**

**1. Grading**

The total marks will be calculated by adding both CIA and the end-semester examinations for each of the courses. The total marks thus obtained will then be graded as per details provided in the following Table-1.

From the second semester onwards, the total performance within a semester and the continuous performance starting from the first semester are indicated by Semester **Grade Point Average (GPA)** and **Cumulative Grade Point Average (CGPA)** respectively. These two are calculated by the following formulae:

$$\text{GPA} = \frac{\sum_{i=1}^{n} C_i G_i}{\sum_{i=1}^{n} C_i}, \qquad \text{WAM (Weighted Average Marks)} = \frac{\sum_{i=1}^{n} C_i M_i}{\sum_{i=1}^{n} C_i}$$

*where,* '$C_i$' is the Credit earned for the Course-*i,*
'$G_i$' is the Grade Point obtained by the student for the Course '*i*',
'M' is the marks obtained for the course '*i*', and
'*n*' is the number of Courses **Passed** in that semester.

CGPA: Average GPA of all the Courses starting from the first semester to the current semester.

**2. Classification of Final Results**

i) For each of the three parts, there shall be separate classification on the basis of the CGPA, as indicated in the following Table-2.



ii) For the purpose of declaring a candidate to have qualified for the Degree of Bachelor of Arts/Science/Commerce/Management/Literature as Outstanding/Excellent/Very Good/Good/Above average/Average, the marks and the corresponding CGPA earned by the candidate in Part-III alone will be the criterion, provided he/she has secured the prescribed passing minimum in the LCs and the ELCs.

iii) Grade in Part-IV and Part-V shall be shown separately and it shall not be taken into account for classification.

iv) Absence from an examination shall not be taken as an attempt.

**Table-1: Grading of the Courses**

| Marks Range | Grade Point | Corresponding Grade |
|---|---|---|
| 90 and above | 10 | O |
| 80 and above but below 90 | 9 | A+ |
| 70 and above but below 80 | 8 | A |
| 60 and above but below 70 | 7 | B+ |
| 50 and above but below 60 | 6 | B |
| 40 and above but below 50 | 5 | C |
| Below 40 | 0 | RA |

**Table-2: Final Result**

| CGPA | Classification of Final Results | Corresponding Grade |
|---|---|---|
| 9.00 and above | O | Outstanding |
| 8.00 to 8.99 | A+ | Excellent |
| 7.00 to 7.99 | A | Very Good |
| 6.00 to 6.99 | B+ | Good |
| 5.00 to 5.99 | B | Above Average |
| 4.00 to 4.99 | C | Average |
| Below 4.00 | RA | Re-appearance |

Credit based weighted Mark System isadopted for individual semesters and cumulative semesters in the column 'Marks Secured' (for 100).
A Pass in SHEPHERD will continue to be mandatory although the marks will not count for the calculation of the CGPA.

**Declaration of Result:**

Mr./Ms. _____ has successfully completed the Under Grduate in _____ programme. The candidate's Cumulative Grade Point Average (CGPA) in Part-III is _____ and the class secured is _____ by completing the minimum of 150 credits. The candidate has acquired _____ (if any) more credits from SHEPHERD / AICUF/ Fine Arts / Sports & Games / NCC / NSS / Nature Club etc. The candidate has also acquired _____ (if any) extra credits offered by the parent department courses.

## B. Sc. Physics

## Course Pattern - 2017 Set

| Sem. | Part | | Code | Course | Hr | Cr |
|---|---|---|---|---|---|---|
| I | I | Language | 17UGT110001 | Language– I (Tamil/Hindi/French/Sanskrit) | 4 | 3 |
| | II | English | 17UGE120101 | General English – I | 5 | 3 |
| | III | Core | 17UPH130201 | Core1:Mechanics &Properties of Matter | 7 | 5 |
| | | | @ | Physics Practical-I | 3 | - |
| | | | @ | Basic Workshop Practice | 3 | - |
| | | Allied | 17UPH130401 | Allied I (mandatory)-Mathematics-I | 6 | 5 |
| | IV | NMC | 17UPH140801 | Communicative English | - | 5 |
| | | V. Edn | 17UFC141001 | Essentials of Humanity | 2 | 2 |
| | | | | **Total for Semester-I** | **30** | **23** |
| II | I | Language | 17UGT210002 | Language – II (Tamil/Hindi/French/Sanskrit) | 4 | 3 |
| | II | English | 17UGE220102 | General English – II | 5 | 3 |
| | III | Core | 17UPH230202 | Core 2: Sound, Thermal & Statistical Physics | 5 | 4 |
| | | | 17UPH230203 | Core 3: Physics Practical-I | 3 | 3 |
| | | | 17UPH230204 | Core 4: Basic Workshop Practice | 3 | 3 |
| | | Allied | 17UPH230402 | Allied I (mandatory)-Mathematics-II | 6 | 5 |
| | IV | NMC | 17UCE240802 | Computer Literacy | 2 | 2 |
| | | V. Edn | 17UFC241002 | Fundamentals of Human rights | 2 | 2 |
| | | | | **Total for Semester-II** | **30** | **25** |
| III | I | Language | 17UGT310003 | Language – III (Tamil/Hindi/French/Sanskrit) | 4 | 3 |
| | II | English | 17UGE320103 | General English – III | 5 | 3 |
| | III | Core | 17UPH330205 | Core5:Mathematical Physics | 8 | 6 |
| | | | @ | Physics Practical –II | 3 | - |
| | | Extra Credit Course | 17UPH330501 | Massive Open Online Course | - | (2) |
| | | Allied | 17UPH330403A | Allied II (optional) Chemistry-I | 4 | 4 |
| | | | 17UPH330403B | Computer Science-I | | |
| | | Allied | @ | Allied: Chemistry Practical / Computer Practical | 2 | - |
| | IV | NMC | 17UCE340901 | Environmental Studies | 2 | 2 |
| | | V. Edn. | 17UFC341003A | Formation of youth - I OR | 2 | 2 |
| | | | 17UFC341003B | Religious Doctrine - I | | |
| | | | | **Total for Semester-III** | **30** | **20+(2)** |



| Sem | Part | | Code | Subject Title | Hr | Cr |
|---|---|---|---|---|---|---|
| IV | I | Language | 17UGT410004 | Language-IV (Tamil/Hindi/French/Sanskrit) | 4 | 3 |
| | II | English | 17UGE420104 | General English-IV | 5 | 3 |
| | III | Core | 17UPH430206 | Core 6: Electricity & Magnetism | 6 | 4 |
| | | | 17UPH430207 | Core 7: Physics Practical-II | 3 | 3 |
| | | Allied | 17UPH430404A 17UPH430404B | Allied-II (optional): Chemistry-II / Computer Science-II | 4 | 4 |
| | | | 17UPH430405A 17UPH430405B | Allied: Chemistry Practical / Allied: Computer Practical | 2 | 2 |
| | | Core Elec.1 WS | 17UPH430301A 17UPH430301B 17UPH430301C | Energy Physics (or) Physics of Material (or) Fundamentals of Electricity & Magnetism | 4 | 4 |
| | IV | V. Edn | 17UFC441004A | Formation of youth-II (or) | 2 | 2 |
| | | | 17UFC441004B | Religious Doctrine-II | | |
| | | | | **Total for Semester IV** | **30** | **25** |
| V | III | Core | 17UPH530208 | Core 8: C programming for physics | 5 | 4 |
| | | | 17UPH530209 | Core 9: Atomic Solid State & Nuclear Physics | 6 | 4 |
| | | | 17UPH530210 | Core 10: Analog Electronics | 5 | 4 |
| | | | 17UPH530211 | Core 11: Physics Practical-III | 6 | 3 |
| | | Extra Credit Course | 17UPH530502 | Extra Credit Course | - | (2) |
| | | Core Elec.2 WD | 17UPH530302A | Photography and Videography (or) | 4 | 4 |
| | | | 17UPH530302B | Biomedical Instrumentation | | |
| | IV | SB Elec. | 17UPH540601 | Electrical Wiring (BS) | 2 | 2 |
| | | SPL | 17UPH530212 | Astronomy (Partial on-line) | - | 2 |
| | IV | IDC | 17USS540701A | Soft Skills | 2 | 2 |
| | | | 17USS540701B | National Cadet Corps (NCC) | | |
| | | | | **Total for Semester V** | **30** | **25+2** |
| VI | III | Core | 17UPH630213 | Internship | - | 2 |
| | | | 17UPH630214 | Core 12: Optics, Spectroscopy and Laser | 5 | 4 |
| | | | 17UPH630215 | Core 13: Quantum Mechanics & Relativity | 5 | 4 |
| | | | 17UPH630216 | Core 14: Digital Electronics & Microprocessor | 5 | 4 |
| | | | 17UPH630217 | Core 15: Physics Practical – IV | 6 | 3 |
| | | | 17UPH630218 | Project Work | 3 | 2 |
| | | | 17UPH630219 | Comprehensive Examination | - | 2 |
| | | Core Elec.3 WD | 17UPH630303A | Communication systems (or) | 4 | 4 |
| | | | 17UPH630303B | Astrophysics | | |
| | IV | SB Elec.WS | 17UPH640602 | Cell Phone Servicing | 2 | 2 |
| | | | | **Total for Semester VI** | **30** | **27** |
| I–V | V | SHEPHERD | 17UCW651101 | Community service Work (SHEPHERD) & Gender Studies | - | 5 |
| | | | | **Total for All Semesters** | **180** | **150+4** |

* Compulsory Internship Programme for UG will be arranged during the Summer Vacation before the V$^{th}$ Semester.

**Note:**

Comprehensive Examination will be conducted as online objective type test based on the question bank given to the students.

Skill Based Elective (partly online)

**Programme Outcomes (POs):**

1. Undergraduate students are to be passionately engaged in initial learning with an aim to think differently as agents of new knowledge, understanding and applying new ideas in order to acquire employability/ self-employment.
2. Undergraduate students are trained to take up higher learning programmes.
3. Undergraduate students are made to be competent and socially responsible citizen of India.
4. Undergraduate students are to be exposed to technical, analytical and creative skills.
5. Undergraduate students are to be imparted with a broad conceptual background in the Biological sciences / Computing sciences / Languages and culture / Management studies / Physical sciences.

**Programme Specific Outcomes (PSOs):**

1. Enhancing conceptual knowledge
2. Awareness on impact of physics
3. Observational, measuring and computational techniques
4. Imparting experimental skills
5. Problem analyzing, logical thinking, reasoning, troubleshooting and solving skill
6. Hands on training in workshop and Information Technology/Techniques
7. Ethics, Social Responsibility, Leadership and Entrepreneurial Skills Research Orientation and Internship and Employability Enhancement.

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**பருவம்: 1** **மணி நேரம்: 4**

**17UGT110001** **புள்ளிகள்: 3**

## பொதுத்தமிழ்-I

**பாடத்தின் விளைவு**

- சமூக மாற்றச் சிந்தனைகளை உள்ளடக்கிய தற்கால இலக்கியப்பரப்பை அறிதல்
- புதுக்கவிதை, சிறுகதை, உரைநடை ஆகியவற்றின் இலக்கியத்திறன் கண்டறிதல்.
- சந்திப்பிழையின்றி எழுதும் திறன் பெறுதல்.
- வாழ்க்கை வரலாற்றுக் கட்டுரைகளை வாசிக்கும் திறன் பெறுதல்.
- அன்றாடப் பயன்பாட்டிலுள்ள ஆங்கிலச்சொற்களுக்குப் பொருத்தமான சொற்களை உருவாக்கச்செய்தல்
- அரசுப்போட்டித் தேர்வுகளுக்கேற்ப தமிழ்மொழியில் பயிற்சி அளித்தல்.

**அலகு-1** மகாகவி பாரதியார் கவிதைகள்
பாரதிதாசன் கவிதைகள்
நாமக்கல் கவிஞர் கவிதைகள்
உரைநடை - முதல் மூன்று கட்டுரைகள் (12 மணி நேரம்)

**அலகு-2** பாவலரேறு பெருஞ்சித்திரனார் பாடல்கள்
கண்ணதாசன் கவிதைகள்
இலக்கிய வரலாறு (பக். 239- 300)
இலக்கணம் -வலிமிகும் இடங்கள் (14 மணி நேரம்)

**அலகு-3** சமூகக்கவிதைகள்
இலக்கிய வரலாறு (பக்.300 -362)
சிறுகதை - முதல் ஆறு சிறுகதைகள் (14 மணி நேரம்)

**அலகு-4** அரசியல் கவிதைகள்
இலக்கணம் - வலி மிகா இடங்கள் (10 மணி நேரம்)

**அலகு-5** மொழிபெயர்ப்புக்கவிதைகள்
சிறுகதை- 7 முதல் 12 முடிய உள்ள சிறுகதைகள்
உரைநடை- 4முதல் 6 முடிய உள்ள கட்டுரைகள்
(10 மணிநேரம்)

**பாடநூல்**

1. பொதுத்தமிழ்- செய்யுள் திரட்டு- தமிழாய்வுத்துறை வெளியீடு-2017-2020
2. சமூகவியல் நோக்கில் தமிழ் இலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2
3. உரைநடை நூல் - தமிழாய்வுத்துறை வெளியீடு.
4. சிறுகதைத்தொகுப்பு : (நாட்டுடைமையாக்கப்பட்ட படைப்பாளர்களின் சிறுகதைகள்), தமிழாய்வுத்துறை வெளியீடு.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UGT110001 | | | Title of the Paper பொதுத்தமிழ்-1 | | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 5 | 4 | 3 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 4 | 5 | 4.2 |
| CO2 | 5 | 5 | 5 | 3 | 4 | 5 | 4 | 5 | 4 | 3 | 3 | 4 | 5 | 4.2 |
| CO3 | 4 | 4 | 5 | 4 | 3 | 4 | 3 | 5 | 4 | 3 | 3 | 4 | 5 | 3.9 |
| CO4 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 3 | 5 | 5 | 5 | 4.5 |
| CO5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 4 | 5 | 5 | 4.0 |
| CO6 | 5 | 5 | 5 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 5 | 3.8 |
| | | | | | | | | | | | | | Mean Overall Score | 4.1 |

**Result: The Score for this Course is 4.1 (Very High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling*:

| **Mean Score of COs** = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$ | **Mean Overall Score for COs** = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$ |
|---|---|



**Semestre: I** **Hours/Week: 4**
**17UGH110001** **Credits : 3**

## HINDI-I

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* Knowledge and understanding of Hindi Conversations
* Improvement of the writing skills.
* Knowledge of Grammar forms
* Effective communicative skills in Hindi.
* The introduction of socially relevant subjects in Modern Hindi Literature
* Appreciation the features of Modern Hindi Prose.

**Unit-I** **8 hours**

Dr Abdul Kalam, Ling Badaliye, Vachan Badaliye, Baathcheeth-Aspathal Mein

**Unit-II** **12 hours**

Hamara Rajchinha, Noun Ling, Kaarak Chinha, Chaar Baayee, Baathcheeth, Dookan Mein

**Unit-III** **12 hours**

Moun hee mantra hai, Vachan, Kaarak, Vishwamitra Ka yagna, Baathcheeth, Hotel mein

**Unit-IV** **14 hours**

Veer Shivaji, Pronoun, Danush Yagna, Baathcheeth-Maidaan mein

**Unit-V** **14 hours**

Rajatilak Kee Thaiyaree, Adjectives, Baathcheeth-Pareeksha ke baare mein

**Books Recommended**


1. Dakshina Bharathi Hindi Prachar Sabha, Thiagaraya Nagar, Chennai – 600 017, Subhodh Hindi Patamala-2, Bharath Milap, Bharath-1, 2016.
2. Ramdev, Vyakaran Pradeep, Hindi Bhavan, 63, Tagore Nagar, Allahabad 2, 2016.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UGH110001 | | | | | Title of the Paper Hindi-I | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 4 | 3 | 4 | 2 | 2 | 2 | 3 | 4 | 4 | 3.2 | |
| CO2 | 3 | 3 | 2 | 3 | 2 | 4 | 4 | 4 | 3 | 3 | 2 | 3.0 | |
| CO3 | 3 | 2 | 2 | 3 | 4 | 2 | 2 | 2 | 3 | 4 | 4 | 2.8 | |
| CO4 | 3 | 2 | 2 | 3 | 2 | 4 | 4 | 4 | 4 | 2 | 2 | 2.9 | |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3.2 | |
| CO6 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 2 | 4 | 3 | 3 | 3.4 | |
| | | | | | | | | | | | Mean Overall Score | 3.1 | |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semestre: I** **Heures /Semaine: 4**
**17UGF110001** **Credits: 3**

## FRANÇAIS-I

**Course Outcomes**

* Introduire la langue et la culture française aux étudiants
* Comparer la culture de l'Inde et de la France
* Familiariser l'étudiant avec le vocabulaire
* la grammaire et les conversations se présenter
* Donner des informations en Français
* Conjuguer des verbes, Avoir Etre Aller Faire

**Unit-I : Al'aéroport Kamaraj domestic de Chennai** **(10 heures)**

Saluer, demander et dire le nom, présenter quelqu'un, se présenter, souhaiter la bienvenue a quelqu'un, demander et dire l'identité de quelqu'un.
**Grammaire :** Etre, s'appeler, pronoms sujets, interrogation

**Unit-II : A l'Université** **(10 heures)**

Demander comment on se porte, présenter quel qu'un, prendre congé, exprimer, l'appréciation.
**Grammaire :** Articles définis et indéfinis, genre des noms, adjectifs, présent de l'indicatif : verbes réguliers en er, être avoir, apprendre, prépositions a, en, au, aux.

**Unit-III : Au café** **(10 heures)**

Dire ce qu'on aime, donner des informations, exprimer l'admiration, demander des informations sur quelqu'un.
**Grammaire :** Adjectifs interrogatifs, présent de l'indicatif : avoir, verbes en er , savoir, qu'est ce que c'est?, adjectifs possessifs, négation ,adjectifs irréguliers

**Unit-IV : A la plage** **(15 heures)**

Proposer une sortie, accepter, refuser la proposition
**Grammaire :** phrases au singulier et au pluriel, pronom indéfini- on, il y a, adjectifs démonstratifs, négation, interrogation, présent de l'indicatif : faire, voir, aller, sortir, connaitre

**Unit-V : Un concert et chez Nalli** **(15 heures)**

Inviter, accepter, exprimer son incapacité d'accepter, complimenter, parlé au téléphone, demander le prix, protester contre le prix.

**Grammaire :** Présent de l'indicatif : verbes en er, venir, pouvoir, vouloir, articles contracte, avec, a chez, le futur, interrogation est ce que, adverbes

interrogatifs, adjectifs possessifs, accord de l'adjectif, adjectifs exclamatifs, très/trop, présent de l'indicatif : acheter-regarder, l'impératif.

**Manuel:**

1. K.Madanagobalane, **Synchronie-1**, Samhitâ Publication, 2011.

**Livre de référence:**

1. Annie Berthet /B_atrix Sampsonis/ Catherine Hugot /V_ronnique M Kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006.
2. Yves Loiseau/R_gineM_rieux, Connexions 1, Didier, 2011.



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester 1 | Course Code 17UGF110001 | | | | | Title of the Paper French-I | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | |
| CO1 | 4 | 4 | 2 | 3 | 4 | 4 | 4 | 2 | 2 | 3 | 3 | 3.2 |
| CO2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 2 | 3.2 |
| CO3 | 3 | 2 | 3 | 2 | 4 | 3 | 2 | 4 | 4 | 3 | 3 | 3.0 |
| CO4 | 3 | 3 | 4 | 3 | 4 | 2 | 2 | 3 | 3 | 2 | 2 | 2.8 |
| CO5 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 4 | 5 | 2 | 3.4 |
| CO6 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 4 | 3 | 3.1 |
| | | | | | | | | | Mean Overall Score | | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester: I** **Hours/Week: 4**

**17UGS110001** **Credits : 3**

## SANSKRIT-I

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* Knowledge and understanding of basic Sanskrit grammar
* Knowledge and understanding of essential Sanskrit vocabulary
* Introduction of the writing skills
* Introduction of Sanskrit Aksharas.
* Introduction of Present tense forms
* Implementation of good thoughts from Subashitani

**Unit-I** **8 hours**

Akharavivaranam – Svaras & Vyanjanaani – Samyukta Aksharani.

**Unit-II** **12 hours**

Shabdadayah – Aakaaraanta, ikaar aantah. ukaaraantah.

Shabdadayah – Aakaaraanta, iikaar aantah. uukaaraantah.

**Unit-III** **12 hours**

Anuvaada Prayogah.

**Unit- IV** **14 hours**

Lat Lakarh – Parasmai – Pada Prayogah = Vakyarupah.

**Unit-V** **14 hours**

Subhaashitaani

**Books Recommended**


1. Kulapathy, K. M., Saral Sanskrit Balabodh, Bharathiya Vidya Bhavan, Munshimarg, Mumbai-400 007, 2014
2. R.S. Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat-678003, Kerala, SOuth India, Shabdha Manjari, 2014
3. Balasubramaniam R., Samskrita Akshara Siksha, Vangals Publication, 14th Main Road, JP Nagar, Bangalore -78, 2015.




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UGS110001 | Title of the Paper Sanskrit-I | | | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 5 | 3 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | | 3.1 |
| CO2 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | | 3.3 |
| CO3 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | | 3.1 |
| CO4 | 4 | 3 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 | | 3.0 |
| CO5 | 4 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | | 3.1 |
| CO6 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | | 3.1 |
| | | | | | | | | | Mean Overall Score | | | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester: I** **Hours/Week: 5**
**17UGE120101** **Credits: 3**

## GENERAL ENGLISH-I

**Course Outcome**

* Introduce themselves to the others
* Narrate simple experiences in a coherent manner
* Understand the underlying meaning in the text
* Describe accurately what he/she observes and experiences
* Converse with friends about their likes and dislikes
* Write leave letters using the appropriate format and language

**Unit-I:**

01. Personal Details
02. Positive Qualities
03. Listening to Positive Qualities
04. Relating and Grading Qualities
05. My Ambition
06. Abilities and Skills
07. Self-Improvement Word Grid
08. What am I doing?
09. What was I doing?
10. Unscramble the Past Actions
11. What did I do yesterday?

**Unit-II:**

12. Body Parts
13. Actions and Body Parts
14. Value of Life
15. Describing Self
16. Home Word Grid
17. Unscramble Building Types
18. Plural Form of Naming Words
19. Irregular Plural Forms
20. Plural Naming Words Practice
21. Whose Words?

**Unit-III:**

22. Plural Forms of Action Words



23. Present Positive Actions
24. Present Negative Actions
25. Un/Countable Naming Words
26. Recognition of Vowel Sounds
27. Indefinite Articles
28. Un/Countable Practice
29. Listen and Match the Visual
30. Letter Spell - Check
31. Drafting Letter

**Non-Detailed:**

**"The Merchant of Venice" from *Six Tales From Shakespeare***

**Unit-IV:**

32. Friendship Word Grid
33. Friends' Details
34. Guess the Favourites
35. Guess Your Friend
36. Friends as Guests
37. Introducing Friends
38. What are We Doing?
39. What is (s)he / are they Doing?
40. Yes / No Question
41. What was s/he doing?
42. Names and Actions
43. True Friendship
44. Know your Friends
45. Giving Advice/Suggestions
46. Discussion on Friendship
47. My Best Friend

**Non-Detailed:**

**"The Taming of the Shrew" from *Six Tales From Shakespeare***

**Unit-V:**

48. Kinship Words
49. The Odd One Out
50. My Family Tree
51. Little Boy's Request

52. Occasions for Message
53. Words denoting Place
54. Words denoting Movement
55. Phrases for Giving Directions
56. Find the Destination
57. Giving Directions Practice
58. SMS Language
59. Converting SMS
60. Writing Short Messages
61. Sending SMS
62. The family debate
63. Family Today

**Non-Detailed**: **"The Tempest" from *Six Tales From Shakespeare***

**Textbook**


1. Joy, J.L. & Peter, F.M. *Let's Communicate 1*, New Delhi, Trinity Press, 2014. Print.


**Non-Detailed Text**


1. Dodd, E F. *Six Tales From Shakespeare*. London: Macmillan, 1987. Print. (First three tales)


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UGE120101 | | | | | Title of the Paper General English-I | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 3 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | | 3.80 |
| CO2 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | | 4.10 |
| CO3 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 | 4 | | 3.60 |
| CO4 | 4 | 3 | 2 | 4 | 4 | 4 | 4 | 3 | 3 | 5 | 5 | 4 | 4 | | 3.80 |
| CO5 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 5 | 5 | | 3.90 |
| CO6 | 5 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | | 3.90 |
| | | | | | | | | | | | | Mean Overall Score | | | 3.85 |

**Result: The Score for this Course is 3.85 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling*:**

$$\textbf{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \textbf{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester I** **Hours/Week: 7**
**17UPH130201** **Credits: 5**

## MECHANICS AND PROPERTIES OF MATTER

**Course Outcomes:**

1. The concepts of statics, hydrostatics, hydrodynamics and the rigid body dynamics in terms of Moments of Inertia.
2. Learn to solve problems in statics
3. Gravitation at various situations and its applications
4. Acquire a knowledge of variations of acceleration due to gravity and its importance
5. The basics of Elasticity and its importance in beams, girders
6. Acquire the knowledge of experimental ideas of finding elasticity
7. The concepts of viscosity, surface tension and the various methods
8. Acquire the knowledge of experimental ideas of finding viscosity and Surface tension

### UNIT I: STATICS (12 Hrs)

Friction-Laws of friction-Equilibrium on a rough inclined plane-two body problem and the reduced mass-impulse of a force- Collision – oblique impact of a smooth sphere on a fixed smooth plane- Direct impact of two smooth spheres – loss of kinetic energy due to direct impact and oblique impact of two smooth spheres.

### UNIT II: HYDROSTATICS AND HYDRODYNAMICS (12 Hrs)

Centre of pressure – centre of pressure of a rectangular lamina and triangular lamina – Atmospheric pressure – Variation of atmospheric pressure with altitude – Equation of continuity – Energy of liquid –Euler's equation – Bernoulli's theorem –Applications.

### UNIT III: DYNAMICS OF RIGID BODIES (12 Hrs)

Moment of inertia - Radius of gyration - Theorems of M .I - M.I of circular disc, solid cylinder , hollow cylinder , solid sphere and hollow sphere - K.E of a rotating body – M.I of a diatomic molecule – Rotational energy state of a rigid diatomic molecule - centre of mass – conservation of linear momentum – Relation between Torque and angular momentum.

### UNIT IV: GRAVITATION AND ELASTICITY (12 Hrs)

Newton's law – Kepler's law – G by Boy's method – Gravitational field and potential – potential and field due to a spherical shell and solid sphere –



Compound pendulum – Modulli of elasticity – work done in a strain – Rigidity modulus by static torsion (scale & telescope ) Torsional oscillation of a body - Bending of beams – bending moment – cantilever – Y - Uniform and non- uniform bending.

### UNIT V: VISCOSITY AND SURFACE TENSION (12 Hrs)

Critical velocity – Poiseullie's formula – coefficient of viscosity - h by variable pressure head – Terminal velocity and Stoke's formula – Stokes method – variation of viscosity with temperature and pressure – viscosity of gases – Rankine's method – Surface tension – work done – Angle of contact – Quincke's method –Drop weight method.

**BOOKS FOR STUDY:**


1. R. Murugeshan , Mechanics and Mathematical Physics , S. Chand & Company Ltd New Delhi (Third Revised Edition 2008).
2. R. Murugeshan, Properties of Matter, S. Chand & company Ltd, New Delhi (2016).


| Unit | Book | Sections |
|---|---|---|
| I | 1 | 14.1-14.3,14.5,2.4 |
| | 2 | 8.1 – 8.6 |
| II | 1 | 4.1-4.6, 4.8, 5.1-5.4 |
| III | 2 | 7.1-7.3,7.5-7.7, 7.9, 7.10, 10.5,10.6 |
| | 1 | 13.1, 13.3,13.4,13.5. |
| IV | 2 | 6.1-6.6, 6.10, 1.1,1.2, 1.5, 1.11,1.13 -1.16, 1.21 . |
| V | 2 | 2.1-2.3,2.5,2.7 -2.10, 2.13,2.14, 3.1,3.3,3.6,3.13,3.15,3.17 |

**BOOKS FOR REFERENCE:**


1. Mechanics, D.S. Mathur , S.Chand& Company Ltd, New Delhi(2000)
2. Properties of matter by BrijLal and N. Subramaniam, S. Chand & Co, New Delhi(1994)
3. Fundamentals of Physics D. Halliday, R. Resnick and J. Walker, 6th edition, Wiley, NY.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UPH130201 | | | | Title of the Paper: MECHANICS AND PROPERTIES OF MATTER | | | | | | | | Hours 7 | Credits 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 3 | 1 | 3 | 5 | 5 | 4 | 4 | 4 | 3 | 1 | 1 | 2 | 3.2 |
| CO2 | 3 | 3 | 1 | 3 | 4 | 3 | 2 | 4 | 4 | 5 | 3 | 2 | 4 | 3.2 |
| CO3 | 4 | 3 | 1 | 2 | 4 | 4 | 3 | 4 | 4 | 3 | 2 | 2 | 4 | 3.1 |
| CO4 | 4 | 3 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 4 | 1 | 3 | 5 | 3.3 |
| CO5 | 5 | 2 | 2 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 2 | 3 | 4 | 3.1 |
| CO6 | 4 | 3 | 1 | 3 | 4 | 3 | 2 | 3 | 3 | 4 | 3 | 2 | 4 | 3.0 |
| CO7 | 5 | 3 | 2 | 3 | 4 | 5 | 4 | 3 | 4 | 3 | 2 | 1 | 2 | 3.2 |
| CO8 | 4 | 3 | 2 | 3 | 4 | 4 | 2 | 3 | 3 | 4 | 1 | 2 | 4 | 3.2 |
| | | | | | | | | | | | | Mean Overall Score | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester I** **Hours/Week: 6**
**17UPH130401** **Credits: 5**

**Allied: MATHEMATICS-I**

**Course Outcomes:**

1. Basic Properties of Integration and Differentiation.
2. Derivation of Reduction Formulas.
3. Solving Differential Equations
4. Expansions of Trigonometric functions
5. Basic concepts of Matrix
6. Properties of Matrices and Eigen Values and vectors.
7. Concept of limit of a sequence and series.
8. Techniques in Series

**Unit - I: Differential and Integral Calculus**

Higher derivatives - Leibnitz's formula for the nth derivatives of a product (No proof) - Integration by parts. (Book 1 : Chapter 6 - Sec 6.1, pp: 266-281, Book 2 : Chapter 1 - Sec 12, pp: 68-72)

**Unit - II: Reduction formula**

Properties of definite integrals - Reduction formula for cosnx, sinnx, xneax, cosnx sinnx and tannx.

(Book 2 : Chapter 1 - Sec 11, 13.1,13.3 - 13.6, pp: 61-67, 73-82)

**Unit - III: Differential equations**

First order differential equations - Variable separable - Homogenous equations - Non-homogenous equations - Linear equation - Bernoulli's equation. Second order differential equations - linear equation with constant co-efficients. (Book 3 : Differential equations - Chapter 2 - Sec 1-5, pp: 7-18, Chapter 3 - Sec 1-4, pp: 42-60)

**Unit - IV: Algebra**

Matrices - Rank of a matrix - Solving simultaneous linear equations in three unknowns using elementary operations method - Eigen values and Eigen vectors - Verification of Cayley's Hamilton theorem. (Book 1 : Chapter 3 - Sec 3.2 - 3.4, pp: 137 - 160).

**Unit - V: Convergence of Series**

Concept of limit of a sequence - limit of a function - Simple problems - Convergence, divergence and oscillation of a series - geometric series -

tests of convergence and divergence, comparison, ratio and root tests (without proof). (Book 4 : Chapter 6 - Sec1-14)

**Books for Study**

1. Ancillary Mathematics, Vol-I, 2009 Edition, S. Narayanan, R.Hanumantha Rao, T.K. Manicavachagom Pillay and Kandaswamy.
2. Ancillary Mathematics, Vol-II, 2010 Edition, S. Narayanan, R. Hanumantha Rao, T.K. Manicavachagom Pillay and Kandaswamy.
3. Ancillary Maths, Book II, 1999 Edition, S. Narayanan and T.K. Manickavasagam pillai.
4. Higher Mathematics for Engineering and Science, Third Edition, The National Publishing Co., Madras, 1986, M.K.Venkataraman

**REFERENCES**


1. S.Narayanan, R.Hanumantha Rao, T.K.Manicavachagom Pillay," Ancillary Mathematics" Volume-I-2009 edition.
2. S.Narayanan & T.K.Manichavachagom Pillay," Differential equation and its applications", S.Viswanathan Pvt. Ltd., 2001




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UPH130401 | Title of the Paper: Allied: MATHEMATICS-I | | | | | | | | | | | Hours 6 | Credits 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 3 | 3 | 5 | 4 | 4 | 4 | 3 | 2 | 4 | 3 | 2 | 2 | 3.3 |
| CO2 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 2 | 3 | 4 | 3 | 2 | 2 | 3.2 |
| CO3 | 3 | 4 | 2 | 4 | 5 | 4 | 4 | 2 | 3 | 4 | 3 | 2 | 3 | 3.3 |
| CO4 | 4 | 3 | 2 | 4 | 4 | 4 | 4 | 3 | 2 | 4 | 3 | 2 | 2 | 3.2 |
| CO5 | 4 | 4 | 2 | 4 | 4 | 4 | 3 | 2 | 3 | 4 | 4 | 2 | 2 | 3.2 |
| CO6 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3.2 |
| CO7 | 3 | 4 | 2 | 4 | 5 | 4 | 4 | 2 | 3 | 4 | 2 | 2 | 3 | 3.2 |
| CO8 | 3 | 4 | 2 | 4 | 5 | 4 | 4 | 2 | 3 | 4 | 2 | 2 | 3 | 3.2 |
| | | | | | | | | | | | | Mean Overall Score | | 3.2 |

**Result: The Score for this Course is 3.2 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester I** **Hours/Week:2**
**17UFC141001** **Credits: 2**

## ESSENTIALS OF HUMANITY

**Course Outcome**

1. To ensure creating awareness among the youth on human values.
2. To ensure educating the youth, the basic principles of value education.
3. To ensure the process of analyzing, appreciating and personalizing values as our own.
4. To ensure that students develop various dimensions of human personality.
5. To ensure the youth empowering the gender sensitization, gender differences and gender roles.
6. To ensure preparing the students for the smooth transfer from the stage of teenage to earlier adulthood.

**Unit-I**

**Principles of Value Education** - Introduction - Value Education- Characteristics of Values – Kinds of Values

**Unit-II**

**Development of Human Personality** - Personality traits - Theories of Personality - Discovering self- Defense mechanism - Power of positive thinking

**Unit-III**

**Dimensions of Human Development** - Physical development – Intellectual development - Emotional development - Social Development – Moral development - Spiritual development

**Unit-IV**

**Responsible Parenthood** - Human sexuality - Sex and love - Becoming a spouse - Responsible Parenthood

**Unit-V**

**Gender Equality and Empowerment -** Historical perspective - Education & economic development -Crimes against Women-Women's rights

**Text Book:**

**Essentials of Humanity**, Department of Foundation course, St.Joseph's College, Tiruchirappalli-2, 2016.



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UFC141001 | | | | | Title of the Paper ESSENTIALS OF HUMANITY | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 3 | 1 | 5 | 4 | 3 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 3 | 4.0 | |
| CO2 | 2 | 1 | 5 | 5 | 3 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 3 | 4.0 | |
| CO3 | 2 | 1 | 5 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 3 | 4.1 | |
| CO4 | 2 | 2 | 5 | 4 | 2 | 5 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 4.0 | |
| CO5 | 5 | 2 | 5 | 5 | 2 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4.2 | |
| CO6 | 2 | 1 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 3 | 3.8 | |
| | | | | | | | | | | | | Mean Overall Score | | 4.0 | |

**Result: The Score for this Course is 4.0 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**பருவம்: 2** **மணி நேரம்: 4**

**17UGT210002** **புள்ளிகள்: 3**

## பொதுத்தமிழ்-II

**பாடத்தின் விளைவு**

- சமூக மாற்றச் சிந்தனைகளை உள்ளடக்கிய தற்கால இலக்கியப்பரப்பை அறிதல்
- பக்தி இலக்கியங்களின் வழி இறையியல் கோட்பாடுகளை அறிதல்
- உரைநடைக் கட்டுரை எழுதும் திறன் பெறுதல்- இலக்கணமரபுகளை அறிதல்
- பல்வேறு சமயங்களின் வாழ்வியல் கருத்துக்களை அறிந்து பின்பற்றுதல்
- காப்பியங்களில் உள்ள சமுதாயக் கருத்துக்களை அறிந்துகொள்ளுதல்.
- இதிகாசங்கள் உணர்த்தும் நீதிகளை அறியச்செய்தல்.
  அரசுப்போட்டித் தேர்வுகளுக்கேற்ப பொதுக்கட்டுரைகளும் மொழிப்பயிற்சியும் மாணவர்களுக்கு அளித்தல்.

**அலகு: 1** **(12 மணி நேரம்)**

சிலப்பதிகாரம் - அந்திமாலைச் சிறப்பு செய்காதை

இலக்கிய வரலாறு - சைவம் வளர்த்த தமிழ் முதல் புராணங்கள் முடிய.

இலக்கணம் - எழுத்திலக்கணம்

**அலகு: 2** **(12 மணி நேரம்)**

மணிமேகலை - உலக அறவி புக்க காதை

பெரியபுராணம் - தடுத்தாட்கொண்ட புராணம்

**அலகு: 3** **(12 மணி நேரம்)**

கம்பராமாயணம் - கும்பகர்ணன் வதைப்படலம்

உரைநடை - 7 முதல் 9 முடிய உள்ள கட்டுரைகள்

**அலகு: 4** **(12 மணி நேரம்)**

சீறாப்புராணம் - மானுக்குப் பிணை நின்ற படலம்

இலக்கணம் - சொல்லிலக்கணம்

இலக்கிய வரலாறு - தமிழ் இலக்கண நூல்கள் முதல் சிற்றிலக்கியங்கள் முடிய.

**அலகு: 5** **(12 மணி நேரம்)**

இரட்சணிய யாத்திரிகம் - மரணப்படலம்

உரைநடை - 10 முதல் 12 வரையிலான கட்டுரைகள்

**பாடநூல்:**


1. செய்யுள் திரட்டு, தமிழாய்வுத்துறை வெளியீடு, 2017-10
2. சமூகவியல் நோக்கில் தமிழ் இலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2
3. உரைநடை நூல் - தமிழாய்வுத்துறை வெளியீடு.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UGT210002 | | | | | Title of the Paper பொதுத்தமிழ்-II | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 2 | 4 | 4 | | 4.2 |
| CO2 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | 4 | 3 | | 4.4 |
| CO3 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 3 | 3 | 4 | 3 | | 4.3 |
| CO4 | 5 | 5 | 4 | 3 | 4 | 5 | 5 | 5 | 4 | 3 | 3 | 4 | 3 | | 4.1 |
| CO5 | 5 | 5 | 4 | 3 | 4 | 5 | 5 | 5 | 4 | 3 | 3 | 4 | 3 | | 4.1 |
| CO6 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 3 | 3 | 4 | 3 | | 4.1 |
| | | | | | | | | | | | | | Mean Overall Score | | 4.2 |

**Result: The Score for this Course is 4.2 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\textbf{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \textbf{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semestre: II** **Hours/Week: 4**
**17UGH210002** **Credits : 3**

## HINDI-II

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

- their effective communicative skills in Hindi
- the introduction of socially relevant subjects in Modern Hindi Literature
- to appreciate the features of Modern Hindi one act plays and short stories
- the ability to fill in application forms Hindi
- use Hindi vocabulary and grammar patterns in a culturally proper ways.
- the ability to write about famous Hindi authors .

**Unit-I** **8 hours**

Paeeksha, Lekak Parichaya, Khani kee Basha – Shyli, Verb, Dhathu, Artha likiye ulte Shabda likiye.

**Unit- II** **12 hours**

Lekak Parichaya Ekanki kee, Basha Shyli, Ander Nagaree, Sankalan Traya, Pareek shaka Khani ke paatra, Kal, Vachya.

**Unit-III** **12 hours**

Chief Kee daavath, Ekanki ke Paatra, Ekankikaar, Ne ka Prayog, Adverb

**Unit- IV** **14 hours**

Do Kalakar, Bahoo kee Vidha, Kahaanikaar, Prepositions, conjunctions

**Unit-V** **14 hours**

Kahani ke paatra, Ekanke ke paatra, lekak parichaya, Interjunctions, Avikari Shabda

**Books Recommended**


1. Dakshina Bharath Hindi Prachara Sabha, Thiagaraya Nagar, Chennai - 600 017, Subodh Hindi Patamala-2, Ekanki, Hindi, 2016.
2. Ram Dev Hindi Bhavan, Vyakaran Pradeep, 63, Tagore Nagar, Alahabad, 2, 2013.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UGH210002 | | | | | | Title of the Paper Hindi-II | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | | Programme Specific Outcomes (PSOs) | | | | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | Mean Score of COs | |
| CO1 | 4 | 4 | 4 | 3 | 4 | | 3 | 2 | 3 | 4 | 4 | 4 | 3.5 | |
| CO2 | 3 | 3 | 2 | 3 | 2 | | 4 | 4 | 3 | 3 | 2 | 2 | 2.8 | |
| CO3 | 3 | 2 | 2 | 3 | 4 | | 2 | 4 | 4 | 2 | 3 | 4 | 3.0 | |
| CO4 | 3 | 2 | 2 | 3 | 3 | | 4 | 3 | 3 | 4 | 3 | 3 | 3.0 | |
| CO5 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | 4 | 3 | 4 | 3 | 3.1 | |
| CO6 | 4 | 4 | 4 | 4 | 3 | | 4 | 3 | 3 | 3 | 3 | 2 | 3.3 | |
| | | | | | | | | | | | Mean Overall Score | | 3.1 | |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semestre: II** **Heures /Semaine: 4**
**17UGF210002** **Credits: 3**

## FRANÇAIS-II

**Course Outcomes:**

* Faire connaissance des journaux, des courriels, des lettres
* Comprendre les conversations téléphoniques.
* Décrire quelque chose
* Demander son chemin
* Parler des activités du week-end
* Accepter, refuser, exprimer la certitude.

**Unit-I: Nouvelles de L'inde** **(10 heures)**

Montrer son inquiétude, s'excuser, exprimer son appréciation, décrire quelqu'un, décrire quelque chose

**Grammaire:** Présent : verbes en er,-ir, le futur, interrogation totale, féminin d'autres adjectifs.

**Unit-II: A la gare Central station** **(10 heures)**

Réserver des billets, demander des renseignements, donner des renseignements

**Grammaire:** pronoms compléments d'objet direct, présent l'impératif :payer ,partir/sortir, l'impératif, expression du temps, construction avec infinitif

**Unit-III : Un lit dans la Cuisine** **(10 heures)**

Donner des ordres, localiser, bire qu'une proposition est stupide ou bizarre

**Grammaire :** Verbes en er-ranger, mettre impératif, il faut, devoir +infinitif, prépositions de lieu

**Unit-IV: Pierre apprend a conduire et mangez –vous correctement ?** **(15 heures)**

Rassurer, exprimer l'indirection exprimer l'autorisation, avertir, demander des informations sur les habitudes de quelqu'un, offrir a manger ou a boire, accepter, refuser, exprimer la certitude.

**Grammaire:** impératif-être, avoir, savoir, pronoms compléments d'objet indirect, le passe compose avec avoir expression de la quantité-articles partitifs, adverbes, pronoms directs et indirects, pronom en, présent des verbes –manger, boire ,offrir ,prendre, la condition avec si.



**Unit-V: Ils ont eu tort tous les deux !et Comment as-tu passe le weekend** **(10 heures)**

Demander son chemin, indiquer le cheminin a quelqu'un, reprocher / conseiller, parler des activités du week-end, demander a quelqu'un de se taire

**Grammaire:** le passe compose, adverbes mots interrogatifs, le passe compose avec être, faire du….pouvoir, vouloir.

**Manuel:**

1. K. Madanagobalane, **Synchronie -1**, Samhitâ publication, 2011.

**Livre de référence:**

1. Annie Berthet / B_atrix Sampsonis / Catherine Hugot / V_ronnique M kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006
2. Yves Loiseau / R_gine M-rieux, Connexions 1, Didier ,2011

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UGF210002 | | | | | Title of the Paper French-II | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 2 | 3 | 4 | 3 | 3 | 2 | 2 | 3 | 3 | 3.0 | |
| CO2 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 2 | 2 | 2 | 3 | 2.8 | |
| CO3 | 3 | 2 | 3 | 2 | 4 | 3 | 3 | 2 | 2 | 3 | 3 | 2.7 | |
| CO4 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3.2 | |
| CO5 | 3 | 3 | 4 | 3 | 4 | 2 | 4 | 4 | 4 | 4 | 5 | 3.6 | |
| CO6 | 3 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 3.5 | |
| | | | | | | | | | | Mean Overall Score | | 3.1 | |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester: II** **Hours/Week: 4**

**17UGS210002** **Credits : 3**

## SANSKRIT-II

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* knowledge and understanding of basic Sanskrit grammar
* knowledge and understanding of essential Sanskrit vocabulary
* knowledge and understanding of the appropriateness of basic Sanskrit structures and expressions in a given context
* the ability to understand short passages in written Sanskrit on everyday topics
* the ability to produce short passages in written Sanskrit on everyday topics
* introduction of basic grammar (Avyaya Imperfect tense and Sandirules. Samasah.)

**Unit-I** **8 hours**

Visheshanaah
Saravanaama shabdas.

**Unit-II** **12 hours**

Sandhi Niyamaah Abhyaasah.(Guna, Visarga, Dirgha, Vrddhi)

**Unit-III** **12 hours**

Lang lakaarah. Kriyapadaani

**Unit-IV** **14 hours**

Gopala Vimshathi. (1-10) slokas.

**Unit-V** **14 hours**

Avyayas, Tatpurusha, Karma dhaaraya samaasah.

**Books Recommended**


1. Paundrapuram Ashram, Srirangam -620 006. Gopalavimshathi, 2014
2. R.S. Vadhyar & Sons, book – Sellers and Publishers, Kalpathi, Palghat-678 003, Kerala, Southe India, Shabdha Manjari, 2014
3. Kulapthy, K. M., Saral Sanskrit Balabodh, Bharathiya Vidya Bhavan, Munshimarg, Mumbai - 400007, 2014

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UGS210002 | | | | | Title of the Paper Sanskrit-II | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 5 | 3 | 5 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 3 | | 3.2 |
| CO2 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | | 3.0 |
| CO3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 3 | | 3.0 |
| CO4 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | | 3.0 |
| CO5 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | | 3.2 |
| CO6 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 3 | | 3.2 |
| | | | | | | | | | | | Mean Overall Score | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester: II** **Hours/Week: 5**
**17UGE220102** **Credits: 3**

## GENERAL ENGLISH-II

**Course Outcome**

* Ask open-ended questions in real-life situations
* Use polite expressions in appropriate ways
* Use correct punctuation marks and capital letters
* Use appropriate vocabulary
* Put ideas into a cohesive paragraph
* Develop positive self-esteem and thereby communicate effectively

**Unit-I**

01. Education Word Grid
02. Reading Problems and Solutions
03. Syllabification
04. Forms for Expressing Quality
05. Expressing Comparison
06. Monosyllabic Comparison
07. Di/polysyllabic Comparison
08. The best monosyllablic Comparison
09. The best di/polysyllabic Comparison
10. Practising Quality Words

**Non-Detailed:**

**"Julius Caesar" from *Six Tales From Shakespeare***

**Unit –II:**

11. Wh Words
12. Yes/No Recollection
13. Unscramble Wh Questions
14. Wh Practice
15. Education and the Poor
16. Controlled Role play
17. Debate on Education
18. Education in the Future
19. Entertainment Word Grid
20. Classify Entertainment Wordlist
21. Guess the Missing Letter

22. Proverb-Visual Description
23. Supply Wh Words
24. Rearrange Questions
25. Information Gap Questions

**Unit-III:**

26. Asking Questions
27. More about Actions
28. More about Actions and Uses
29. Crime Puzzle
30. Possessive Quiz
31. Humourous News Report
32. Debate on Media and Politics
33. Best Entertainment Source

**Unit-IV:**

34. Career Word Grid
35. Job-Related Wordlist
36. Who's Who?
37. People at Work
38. Humour at Workplace
39. Profession in Context
40. Functions and Expressions
41. Transition Fill-in
42. Transition Sord Selection
43. Professional Qualities
44. Job Procedures
45. Preparing a Resume
46. Interview Questions
47. Job Cover Letter Format
49. E-mailing an Application
50. Mock Interview

**Non-Detailed:**

**"King Lear" from *Six Tales From Shakespeare***

**Unit-V:**

51. Society Word Grid
52. Classify Society Wordlist



53. Rearrange the Story
54. Storytelling
55. Story Cluster
56. Words Denoting Time
57. Expressing Time
58. What Can You Buy?
59. Noise Pollution
60. Positive News Headlines
61. Negative News Headlines
62. Matching Conditions
63. What Whould You Do?
64. If I were the Prime Minister
65. My Dream Country

**Non-Detailed: "Macbeth" from *Six Tales From Shakespeare***

**Textbook**

1. Joy, J.L. & Peter, F.M. *Let's Communicate 2*, New Delhi: Trinity Press, 2014. Print.

**Non-Detailed Text**

1. Dodd, E F. *Six Tales From Shakespeare*. London: Macmillan, 1987. Print. (Last three tales)

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UGE12010**2** | | | | | Title of the Paper General English-II | | | | | | | | Hours 5 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | | 3.9 |
| CO2 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 3 | | 4.0 |
| CO3 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 | 4 | | 3.6 |
| CO4 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 5 | 5 | 4 | 4 | | 3.8 |
| CO5 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 5 | 5 | | 3.9 |
| CO6 | 5 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | | 3.9 |
| | | | | | | | | | | | | | Mean Overall Score | | **3.8** |

**Result: The Score for this Course is 3.8 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\textbf{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \textbf{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester II** **Hours/Week: 5**

**17UPH230202** **Credits: 4**

## SOUND, THERMAL AND STATISTICAL PHYSICS

**Course Outcomes:**

1. To know and understand the physics of sound and its applications
2. To know principles of ultrasonics and its applications
3. To learn the nature and transmission of heat by different mechanisms
4. To learn experimental methods to determine the transmission of heat.
5. To understand the laws of thermodynamics and their applications.
6. To Know and analze Maxwell's thermo dynamical relations and their importance.

### UNIT-I: SOUND (12 Hrs)

Wave motion – characteristics of wave motion – transverse, longitudinal wave motion – Newton's formula for velocity of sound – effect of temperature, pressure, density of the medium, humidity and wind – stationary waves – Helmholtz resonator, theory of resonator, vibrations in rods - Kundt's tube -Doppler effect – applications, Acoustics of buildings – Reverberation – Sabine formula for reverberation- Ultrasonics – production and detection of ultrasonic waves – applications of ultrasonic waves.

### UNIT-II: TRANSMISSION OF HEAT (12 Hrs)

Coefficient of thermal conductivity- rectilinear flow of heat along a bar – Forbes method – Lee's method for bad conductors and liquids– convection and its applications – Black body – Stefan Boltzmann law – Wien's displacement law – Rayleigh- Jeans law - derivation and experimental verification of Stefan's law – Newton's law of cooling from Stefen's law – solar constant – temperature of the Sun - Angstrom's Pyroheliometer.

### UNIT-III: THERMODYNAMICS I (12 Hrs)

Thermodynamic system – zeroth law of thermodynamics – internal energy - I law of thermodynamics – reversible and irreversible process – Carnot's ideal heat engine – Carnot's cycle – internal combustion engine – Otto and diesel engine - second law of thermodynamics – entropy – change in entropy during reversible and irreversible process – entropy and second law of thermodynamics – third law of thermodynamics

### UNIT- IV: THERMODYNAMICS II (12 Hrs)

Thermodynamic variable – Maxwell's thermodynamic relations –applications – Joule Thomson cooling – temperature of inversion – Clausius Claperon's

latent heat equation – thermodynamic potential – T.dS equation – Joule Thomson porous plug experiment – Joule Thomson expansion – liquefaction of gases – liquefaction of hydrogen and Helium – adiabatic demagnetization – refrigerator.

**UNIT-V: STATISTICAL THERMODYNAMICS (12 Hrs)**

Statistical equilibrium – probability theorems in statistical thermodynamics – Maxwell Boltzmann distribution law – Maxwell - Boltzmann distribution in terms of temperature –Phase space – Fermi-Dirac distribution law – application to electron gas – Bose-Einstein distribution law – application to photon gas - radiation laws – comparison of the three statistics.

**BOOKS FOR STUDY:**


1. Brijlal and Subramanyam, Sound, S. Chand and Co., 1994.
2. Brijlal and Subramanyam, Heat and thermodynamics, S. Chand and Co., 2016.


| Unit | Book | Sections |
|---|---|---|
| I | 1 | Chapter 4: 4.1,4.3-4.5, Chapter 5: 5.4 – 5.9, Chapter 6: 6.1, 6.16, 6.17, Chapter 7: 7.12, 7.13 Chapter 8:8.1 -8.3, 8.6 Chapter 10: 10.14 – 10.16, 10.23 – 10.25, 10.27 |
| II | 2 | Chapter 15; 15.1, 15.2, 15.9, 15.10, 15.12, 15.22, 15.23<br>Chapter 8; 8.8, 8.12, 8.14, 8.15, 8.20, 8.22, 8.21, 8.26, 8.27, 8.28 |
| III | 2 | Chapter 4; 4.1, 4.2, 4.6, 4.7, 4.20, 4.23, 4.24, 4.31, 4.33, 4.28<br>Chapter 5; 5, 5.4, 5.6, 5.15<br>Chapter 6; 6.15 |
| IV | 2 | Chapter 6; 6.1, 6.3, 6.4.2, 6.4.4, 6.4.7, 6.5, 6.9<br>Chapter 2; 2.21<br>Chapter 7; 7.5, 7.6, 7.10, 7.11, 7.16, 7.21 |
| V | 2 | Chapter 9; 9.8<br>Chapter 11; 11.3, 11.4<br>Chapter 10; 10.4<br>Chapter 12; 12.8, 12.9, 12.5, 12.6, 12.7, 12.15 |



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UPH230202 | | | | Title of the Paper: SOUND, THERMAL AND STATISTICAL PHYSICS | | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 3 | 2 | 3 | 4 | 4 | 3 | 2 | 4 | 3 | 3 | 3 | 1 | 3.00 |
| CO2 | 3 | 2 | 1 | 2 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 2 | 3.08 |
| CO3 | 4 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 1 | 3.15 |
| CO4 | 3 | 3 | 1 | 4 | 3 | 3 | 4 | 2 | 3 | 3 | 4 | 3 | 1 | 2.84 |
| CO5 | 3 | 3 | 1 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2.84 |
| CO6 | 4 | 4 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | 3.15 |
| | | | | | | | | | | | Mean Overall Score | | | 3.01 |

**Result: The Score for this Course is 3.0 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester II** **Hours/Week: 6**
**17UPH230203** **Credits: 3**

## PHYSICS PRACTICAL-I

**Any 20 Experiments**

1. Surface Tension – drop weight method.
2. Surface Tension – capillary rise method.
3. Viscosity – constant pressure head.
4. Viscosity – variable pressure head.
5. Viscosity – stokes method.
6. Young's modulus – cantilever / stretching.
7. Young's modulus – non uniform bending (pin and microscope).
8. Sonometer – frequency of the tuning fork – RD of solid.
9. Sonometer – AC frequency determination.
10. Spectrometer – refractive index of a solid prism.
11. Spectrometer – dispersive power of a prism.
12. Potentiometer – internal resistance.
13. Potentiometer – low range voltmeter.
14. P.O Box – temperature coefficient.
15. Carey Fosters bridge – R and ñ.
16. Convex lens – f, R and μ.
17. Concave lens – f, R and μ.
18. Field along the axis of a coil – deflection magnetometer.
19. M1/M2- Tan A Tan B simultaneously.
20. M1/M2 – vibration magnetometer.
21. Air wedge.
22. Newton's rings.
23. B.G. – Figure of merit.
24. B.G. comparison of EMF's and capacitance.
25. Resonators.
26. g – by fall plate.
27. Specific heat by cooling.
28. Specific heat capacity of solid by the method of mixture.

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**Semester II** **Hours/Week: 6**
**17UPH230204** **Credits: 3**

## BASIC WORKSHOP PRACTICE

1. Paper Weight
2. Pen Stand
3. Letter box
4. Wood Carving
5. Electroplating
6. Assembling the Extension board
7. Tube light assembling.

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**Semester II** **Hours/Week: 6**
**17UPH230402** **Credits: 5**

**Allied: MATHEMATICS-II**

**Course Outcomes**

1. Applications of Mathematics to Physics
2. Problem Solving Skills.
3. Meaning and Properties of Vectors
4. Concepts of Vector integration
5. Trigonometrical functions and their properties
6. Techniques in numerical methods
7. Complex functions and Integration
8. Applications of Complex integration

**Unit - I: NUMERICAL METHODS**

Solution of simultaneous linear equations - Gauss Elimination - Gauss Seidal Methods -Numerical Solutions to O.D.E - Solution by Taylor's Methods - Euler's Method - Runge-Kutta Method (4th Order) (Book 4 : Chapter 4 Section 4.2, Chapter 6 Section 6.2 and Chapter 11 - Section 11.6, 11.10, 11.14 and 11.16)

**Unit - II: PARTIAL DIFFERENTIAL EQUATIONS**

Derivation of p.d.e - By elimination of arbitrary functions - Different Integrals of p.d.e - Standard type of first order equations - Lagrange's equation (Book 2 : Chapter 6-Sec 1-6, pp: 252-273).

**Unit - III: VECTORS**

Gradient - divergence and curl - Gauss Divergence Theorem - Green Theorem - Stokes Theorem (No proofs of theorem, only simple applications) (Book 2 : Chapter 8 - Sec 1.17-1.20, 6, 8 and 9, pp: 335-350, 381-389, 393-407).

**Unit - IV: TRIGONOMETRY**

Expansion of Sinnq and Cosnq - Powers of Sines and Cosines of q in terms of function of multiple of q - Hyperbolic functions - Inverse hyperbolic functions (Book 1 : Chapter 5 - Sec 5.1, 5.2 and 5.4, pp: 220-232, 242-256).

**Unit - V: COMPLEX ANALYSIS**

Analytic function - Cauchy Riemann equations (No derivation, only simple applications) - Residues - Evaluation of definite integrals (Integral over the unit circle only) ( Book 3 : Chapter 1 - Sec 11, pp : 43-57, Chapter 5 - Sec 1-3, pp : 185-196).



**Books for Study**

1. Ancillary Mathematics, Vol-I, 2009 Edition, S. Narayanan, R. Hanumantha Rao, T.K. Manicavachagom Pillay and Kandaswamy.
2. Ancillary Mathematics, Vol-II, 2010 Edition, S. Narayanan, R. Hanumantha Rao, T.K. Manicavachagom Pillay and Kandaswamy.
3. Complex Analysis, 1997 Edition, S. Narayanan and T.K.Manickavasagam Pillai.
4. Numerical methods for Science and Engineering, M.K.Venkataraman.

**References**

1. Ancillary Maths, Book II, 1999 Edition, S. Narayanan and T.K. Manickavasagam pillai.
2. Higher Mathematics for Engineering and Science, Third Edition, The National Publishing Co., Madras, 1986, M.K.Venkataraman

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UPH230402 | | | | Title of the Paper: Allied: MATHEMATICS-II | | | | | | | | Hours 6 | Credits 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 3 | 4 | 4 | 3 | 3 | 3 | 2 | 4 | 4 | 3 | 3 | 3 | 4 | 3.3 |
| CO2 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 2 | 3 | 4 | 3 | 2 | 2 | 3.2 |
| CO3 | 3 | 4 | 2 | 4 | 5 | 4 | 4 | 2 | 3 | 4 | 3 | 2 | 3 | 3.3 |
| CO4 | 4 | 3 | 2 | 4 | 4 | 4 | 4 | 3 | 2 | 4 | 3 | 2 | 2 | 3.2 |
| CO5 | 4 | 3 | 3 | 5 | 4 | 4 | 4 | 3 | 2 | 4 | 3 | 2 | 2 | 3.3 |
| CO6 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3.2 |
| CO7 | 3 | 4 | 2 | 4 | 5 | 4 | 4 | 2 | 3 | 4 | 2 | 2 | 3 | 3.2 |
| CO8 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 2 | 3 | 4 | 3 | 2 | 2 | 3.2 |
| | | | | | | | | | | | | Mean Overall Score | | 3.2 |

**Result: The Score for this Course is 3.2 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester II** **Hours/Week: 2**
**17UCE240802A** **Credit: 2**

## COMPUTER LITERACY

**Course Outcomes**

1. Understand the basics of Computer Systems
2. Familiar with the applications of MS-Office / HTML & CSS
3. Know the statistical data analysis using R
4. Aware the latest trends and technologies such as Mobile Computing, Big Data and Analytics, Cloud Computing.
5. Understand the concepts of social networking sites.
6. Knowledge in Cyber Crime and Cyber Ethics.

**Unit-I: Computer System**

Computer - An Introduction - Hardware Components - Input and Output Technologies - Computer Hierarchy- Software Fundamentals - Systems Software and Os- Application Software- Software Licensing - Open Systems- Open Source Software- Programming Languages- Information Systems- General It Trends.

**Unit-II: (For Non-CS)**

**Microsoft Word**: Introduction - Word Environment - Opening and Creating a New Document - Saving Documents - Proofing Features - Printing a Document - Formatting Text - Working with Shapes and Lists - Line and Paragraph Spacing- Working with Tables - Columns and Ordering- Working with Pictures- Working with Headers and Footers - Using Indents and Tabs - Using Mail Merge.

**Microsoft Excel**: Introduction - Document Creation - Renaming a worksheet - Office user interface - Open a New Workbook - Columns, Rows, and Cells - Selecting a cell - - Basic data entry, fill handle - - Insert columns - Arithmetic Calculations & Formulas - Excel Formulas- Calculate with Functions - Function Library - Graphs and Charts - Printing the Document.

**Microsoft Powerpoint**: Starting PowerPoint - Working with Slides - Applying Theme - Animation- Transitions – Views.

**Unit-II: (For CS)**

**HTML:** Introduction - HTML generations – HTML Tags – Headings – Paragraphs – Comments – Line Breaks – Formatting Tags – Hyperlinks – Images – Lists – Tables – Frames – Forms.

**CSS:** Introduction – Use of External Style Sheet – Defining Styles – Use Relative Sizing – Use Numbered Value for Color.

**Unit-III: Statistical Data Analysis**

Introduction - R Programming Language - Basic R Commands - Univariate and Bivariate Statistical Measures - Graphic Representation of Statistical Data - Lab Exercise.

**Unit-IV: SMAC**

Introduction - Understanding the Enterprise of Tomorrow - Social Networking - Mobile Computing - Big Data and Analytics - Cloud Computing

**Unit-V: Cyber Crime**

Definition - List of Cyber Crimes - Cyber Ethics- Unethical Behaviour - Securing information privacy and confidentiality - Internet Ethics - Indian Information Technology Act - Advantages of Cyber Laws - National e-Governance Plan (NeGP) - eCommerce - Electronic Fund Transfer (EFT)

**Book for Study**


1. Department of Foundation Course, "Computer Literacy", St. Joseph's College, 2017.


**Books for Reference**


1. Alexis Leon, "Introduction to computers", Vikas Publishing House Pvt. Ltd., New Delhi, 2008.
2. Alexis Leon and Mathew Leon, "Introduction to computers with Ms Office 2000", Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2005.




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UCE240802A | | | | | Title of the Paper COMPUTER LITERACY | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4.15 |
| CO2 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4.08 |
| CO3 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3.77 |
| CO4 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4.15 |
| CO5 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4.15 |
| CO6 | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4.31 |
| | | | | | | | | | | | | Mean Overall Score | | 4.10 |

**Result: The Score for this Course is 4.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester II** **Hours/Week: 2**
**17UFC241002** **Credits: 2**

## FUNDAMENTALS OF HUMAN RIGHTS

**Course Outcome**

1. To ensure acquiring the knowledge about the historical background of human rights.
2. To ensure sensitizing the young the values of human rights.
3. To ensure the importance of human rights in the Indian context.
4. To ensure learning the fundamental duties in the constitution of India.
5. To ensure educating the youth in respecting and protecting the rights of every other human being.
6. To ensure teaching the youth on the vulnerabilities of women and children.

**Unit-I**

Introduction, Classification of Human Rights, Scope of Human Rights, Characteristics of Human Rights, and Challenges for Human Rights in the 21st Century.

**Unit-II**

Human Rights in Pre-World War Era, Human Rights in Post-World War Era, Evolution of International Human Rights Law - the General Assembly Proclamation, Institution Building, Implementation and the Post Cold War Period. The ICC.

**Unit-III**

Introduction, Classification of Fundamental Rights, Salient Features of Fundamental Rights, and Fundamental Duties

**Unit-IV**

Women's Human Rights, Issues related to women's rights, and Rights of Women's and Children

**Unit-V**

Human Rights Violations, Human Rights Violations in India - the Human Rights Watch Report, January 2012, Human Rights Organizations.

**Text Book:**

1. **Techniques of social Analysis: Fundamentals of Human Rights,** Department of Foundation course, St.Joseph's College, Tiruchirappalli, 2015.



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UFC241002 | | | | | Title of the Paper FUNDAMENTALS OF HUMAN RIGHTS | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 1 | 5 | 5 | 2 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 4.2 | |
| CO2 | 4 | 1 | 5 | 4 | 2 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4.0 | |
| CO3 | 5 | 1 | 5 | 5 | 2 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 4.2 | |
| CO4 | 4 | 1 | 5 | 5 | 2 | 2 | 4 | 3 | 5 | 5 | 4 | 4 | 5 | 3.8 | |
| CO5 | 5 | 1 | 5 | 4 | 1 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4.1 | |
| CO6 | 3 | 1 | 5 | 4 | 1 | 4 | 3 | 5 | 5 | 3 | 4 | 4 | 5 | 3.6 | |
| | | | | | | | | | | | | Mean Overall Score | | 3.9 | |

**Result: The Score for this Course is 3.9 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**பருவம்: 3** **மணி நேரம்: 4**

**17UGT310003** **புள்ளிகள்: 3**

## பொதுத்தமிழ்-III

**பாடத்தின் விளைவு**

- செம்மொழியாம் தமிழ் மொழியின் சிறப்பை அறிதல்.
- பண்டை இலக்கியங்கள் உணர்த்தும் அறக்கருத்துகளை அறிதல்
- புதினம் வாயிலாகத் தற்காலச் சமுதாயச் சிக்கல்களையும், அதற்கான தீர்வுகளையும் ஆராயும் திறன் பெறுதல்
- மானுட வாழ்வில் அகம், புறம் பற்றிய பாகுபாட்டை தமிழ்ச்செய்யுள் வாயிலாக அறிதல்.
- தமிழர்களின் ஈகையும் வீரமும் எடுத்துரைக்கும் புறச்செய்திகளை அறிதல்
- நீதிநூல்கள் மனித வாழ்வை செம்மைப்படுத்தும் பாங்கினை உணர்த்துதல்.

**அலகு: 1** **(12 மணி நேரம்)**

நெடுநல்வாடை (முழுமையும்)

**அலகு: 2** **(12 மணி நேரம்)**

குறுந்தொகை - பாடல்கள் - (32, 323, 305, 290, 168)
யாப்பிலக்கணம் (வெண்பா, ஆசிரியப்பா)

**அலகு: 3** **(12 மணி நேரம்)**

கலித்தொகை - பாடல்கள் - (குறிஞ்சிக்கலி-15, பாலைக்கலி-9, மருதக்கலி-15, நெய்தற்கலி-22, முல்லைக்கலி-07)
இலக்கிய வரலாறு - முதற்பாகம் ('தமிழ் மொழியின் தொன்மையும சிறப்பும்' முதல் 'சங்க தொகை நூல்கள்' முடிய) புதினம்.

**அலகு: 4** **(12 மணி நேரம்)**

பதிற்றுப்பத்து - பாடல்கள் (12, 24,)
புறநானூறு - பாடல்கள் (46, 86, 122, 214, 246)
அணியிலக்கணம்

**அலகு: 5** **(12 மணி நேரம்)**

திருக்குறள் - ஈகை, ஆள்வினை உடைமை, நிறை அழிதல் ஆகிய அதிகாரங்கள்
நாலடியார் - இளமை நிலையாமை(11), பிறன்மனை நயவாமை(82), பெருமை(185), அறிவின்மை(254), காமநுதலியல்.(391).
இலக்கிய வரலாறு - சங்க இலக்கியங்களின் தனித்தன்மைகள் முதல் இரட்டைக் காப்பியங்கள் முடிய

**பாடநூல்கள்:**


1. செய்யுள் திரட்டு, தமிழாய்வுத் துறை வெளியீடு (2017-2020).
2. சமூகவியல் நோக்கில் தமிழிலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, 2014.
3. புதினம் (ஒவ்வொரு கல்வியாண்டும் ஒவ்வொரு புதினம்). காணாமல் போன கவிதை (2017-18).




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UGT310003 | | | | | Title of the Paper பொதுத்தமிழ்-III | | | | | | | | Hours 5 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 4.6 | |
| CO2 | 5 | 5 | 4 | 3 | 4 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 4.4 | |
| CO3 | 5 | 5 | 5 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | 5 | 4.5 | |
| CO4 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 4.8 | |
| CO5 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 3 | 3 | 5 | 4.3 | |
| CO6 | 5 | 5 | 5 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | 5 | 4.5 | |
| | | | | | | | | | | | | | Mean Overall Score | **4.5** | |

**Result: The Score for this Course is 4.5 (Very High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semestre: III** **Hours/Week: 4**
**17UGH310003** **Credits: 3**

## HINDI-III

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* the ability to enable the students to complete the pre-reading task to comprehend the local and global issues in the lessons.
* the ability to enable the students to complete the post-reading task centering on Grammar and Skill Development.
* the relevance of Bhakthi Movement in Hindi Literature.
* the ability to imagine and write poems.
* the ability to quote poetry in Speeches.
* the ability to write friendly and formal letters.

**Unit-I** **8 hours**

Tera Sneh Na Kho oon, Kavi Parichaya, Patra Likne ke Kaaran, Patra Kee Avashyakatha, Sandhi keeiye, Vigrah Keejiye

**Unit-II** **12 hours**

Ek boondh, Tera Sneh Na Kho oon kavitha kee manovygnaik stiti, Chutti Patra, Sandhi

**Unit-III** **12 hours**

Ekloondh Kavitha Ka Uddeshya, Kabir Ke Dohe, Nagar Palika ko Patra, Samas

**Unit-IV** **14 hours**

Vimal Indu Kee Vishal Kiranen, Rahim Ke Dohe, Naukari Keliye Avedan Patra, Upasarga

**Unit-V** **14 hours**

Thulasi ke Dohe, Kitab Maangne Keliye Patra, Pratyaya, Kaviparichaya

**Books Recommended**


1. Dakshina Bharath Hindi Prachara Sabha, Thiagaraya Nagar, Subodh Hindi, Paatamala-3, Chennai-600 017, Hindi, 2016.
2. DBHP Sabha, T.Nagar, Chennai-600 017, Abihav Patralekhan, 2016
3. Ram Dev, Vyakaran Pradeep, Hindi Bhavan, 63 Tagore Nagar, Alahabad 2, 2016.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UGH310003 | Title of the Paper Hindi-III | | | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | | 3.6 |
| CO2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 5 | 3 | 5 | | 3.0 |
| CO3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | | 3.2 |
| CO4 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | | 2.9 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | | 3.2 |
| CO6 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3.3 |
| | | | | | | | | | | Mean Overall Score | | | 3.2 |

**Result: The Score for this Course is 3.2 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semestre: III** **Heures /Semaine: 4**
**17UGF310003** **Credits: 3**

## FRANÇAIS-III

**Course Outcomes**

* Comparer la culture de l'Inde et de la France
* Familiariser l'étudiant avec le vocabulaire, la grammaire et les conversations
* Connaître des journaux, des courriels, des lettres
* Parler des projets de vacances
* Exprimer l'étonnement
* Parler de ses projets d'avenir, exprimer l'opposition.

**Unit-I: Un entretien et Au restaurant (10 heures)**

Demander des informations personnelles à quelqu'un, donner des informations, répondre à une proposition. Réserver une table, demander la carte, commander, apprécier les plats, demander l'addition.

**Grammaire:** Imparfait, Imparfait et passé composé, expression du temps, expression de la conséquence.Le futur, présent des verbes peser, rejoindre, le passé récent, le présent progressif, le futur proche, Restriction-ne…que, moi aussi…

**Unit-II : Enfin les vacances ! et Un autre institut (10 heures)**

Raconter son emploi du temps quotidien, parler des projets de vacances, exprimer l'étonnement. Rassurer/consoler, s'indigner

**Grammaire:** Verbes pronominaux, pronom y, quelqu'un/ne…personne, quelque chose/ne…rien, ne…jamais, Déjà/ne…pas encore, chacun, adjectifs indéfinis.Pronoms relatifs, impératif, indicateurs de temps : de…a, a partir de….jusqu'a, depuis, pendant.

**Unit-III : Un Indien célèbre visite la France et Qui dépense plus? (10 heures)**

Demander des informations sur quelqu'un, demander une opinion, donner son opinion. Dire à quelqu'un d'être prudent, faire des reproches à quelqu'un, se justifier.

**Grammaire:** Pronoms relatifs composés, pronoms compléments d'objet directs et indirectes, opposition savoir/Connaitre, connecteurs chronologiques, nombre ordinaux.Le comparatif, c'est+ nom+ qui, il reste, encore, il y a, souvent.

**Unit-IV: Penser à son avenir - (15 heures)**

Parler de ses projets d'avenir, exprimer l'opposition.



**Grammaire :** Style direct/indirect, proposition introduite par que, mots d'enchaînement – donc, pourtant.

**Unit-V: L'astrologie (15 heures)**

Exprimer des conditions, dire quelque chose n'a pas d'importance, proposer quelque chose.

**Grammaire:** Le conditionnel – la condition.

**Manuel:**

1. K.Madanagobalane, **Synchronie-II**, Samhitâ Publication, 2011.

**Livre de référence :**

1. Annie Berthet /B_atrix Sampsonis/ Catherine Hugot /V_ronnique M Kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006.
2. Yves Loiseau/R_gineM_rieux, Connexions 1, Didier, 2011.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UGF310003 | | | | | Title of the Paper French-III | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 2 | 3 | 4 | 4 | 2 | 3 | 3 | 2 | 2 | | 3.0 |
| CO2 | 3 | 3 | 3 | 3 | 4 | 4 | 2 | 3 | 4 | 2 | 3 | | 3.1 |
| CO3 | 3 | 2 | 3 | 2 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | | 3.0 |
| CO4 | 3 | 3 | 4 | 3 | 4 | 2 | 3 | 3 | 3 | 4 | 4 | | 3.3 |
| CO5 | 3 | 3 | 4 | 3 | 4 | 2 | 3 | 3 | 4 | 4 | 4 | | 3.4 |
| CO6 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | | 3.4 |
| | | | | | | | | | | | Mean Overall Score | | 3.2 |

**Result: The Score for this Course is 3.2 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester: III** **Hours/Week: 4**
**17UGS310001** **Credits : 3**

## SANSKRIT-III

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* Knowledge and understanding of essential Sanskrit vocabulary in a given topic
* Knowledge and understanding of the appropriateness of basic Sanskrit structures in Slokas
* Knowledge of the basic Sanskrit poetry.
* An idea on Epics and Puranas.
* The usage of – Upasargas.
* The familiarization the history of Sankrit literature Vedas – Puranas and Natakas.

**Unit-I** **8 hours**

Romodantam. Balakandam. 1-15

**Unit-II** **12 hours**

Romodantam. Balakandam. 15-30

**Unit-III** **12 hours**

Vedas – Vedangas. vivaranam.

**Unit-IV** **14 hours**

Puranas. Upanishads.

**Unit-V** **14 hours**

Upasargas. Bhavishyat Kaalah

**Books recommended:**


1. Parameshwara, Ramodantam, LIFCO, Chaennai, 2015.
2. R.S. Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat-678003, Kerala, South India, History of Sanskrit Literature, 2015.
3. Kulapathy, K.M., Saral Sanskrit Balabodh, Bharathiya Vidya Bhavan, Munshimarg, Mumbai-400 007, 2015.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UGS310003 | Title of the Paper Sanskrit-III | | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | Mean Score of COs |
| CO1 | 5 | 3 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 3.1 |
| CO2 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 3.1 |
| CO3 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 3.1 |
| CO4 | 4 | 3 | 3 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 3.1 |
| CO5 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 4 | 3 | 4 | 4 | 3.1 |
| CO6 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | 3.1 |
| | | | | | | | | | | Mean Overall Score | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**



***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling*:**

| **Mean Score of COs** = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$ | **Mean Overall Score for COs** = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$ |
|---|---|

**Semester: III** **Hours/Week: 5**

**17UGE320103** **Credits: 3**

**GENERAL ENGLISH-III**

**Course Outcome**

* Comprehend the local and global issues through the lessons
* Do the tasks centering on skill development and enhance their Grammar Using and Writing Skills
* Use interactive skills
* Train and develop the Listening and Reading Skills of the learners through teacher-led reading practice
* Enhance their Listening, Reading, Speaking, and Writing Skills
* Develop their Creative and Critical Thinking and Speaking Skills

**Unit-I: *Suggestions to Develop Your Reading Habit**

1.0 Introduction
1.1 Objectives
1.2 Listening and Reading Skills through Teacher-led Reading Practice
1.3 Glossary
1.3.1 Words
1.3.2 Phrases
1.4 Reading Comprehension
1.5 Critical Analysis
1.6 Creative Task
1.7 General Writing Skill: Letter Writing: Informal
1.8 Grammar: Simple Present Tense
1.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times.*

**Unit-II: *The Secret of Success: An Anecdote**

2.0 Introduction
2.1 Objectives
2.2 Listening and Reading Skills through Teacher-led Reading Practice
2.3 Glossary
2.3.1 Words
2.3.2 Phrases
2.4 Reading Comprehension
2.5 Critical Analysis
2.6 Creative Task
2.7 General Writing Skills: Letter Writing: Formal

2.8 Grammar: Present Continuous Tense
2.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times.*

**Unit-III**: ***The Impact of Liquor Consumption on the Society**
3.0 Introduction
3.1 Objectives
3.2 Listening and Reading Skills through Teacher-led Reading Practice
3.3 Glossary
3.3.1 Words
3.3.2 Phrases
3.4 Reading Comprehension
3.5 Critical Analysis
3.6 Creative Task
3.7 General Writing Skills: Letter to Newspaper
3.8 Grammar: Simple Past Tense
3.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times.*

**Unit-IV: * Dr. A.P.J. Abdul Kalam: A Short Biography**
4.0 Introduction
4.1 Objectives
4.2 Listening and Reading Skills through Teacher-led Reading Practice
4.3 Glossary
4.3.1 Words
4.3.2 Phrases
4.4 Reading Comprehension
4.5 Critical Analysis
4.6 Creative Task
4.7 General Writing Skill: Write a letter applying for a job
4.8 Grammar: Past Continuous Tense
4.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times.*

**Unit-V: *Golden Rule: A Poem**
5.0 Introduction
5.1 Objectives
5.2 Listening and Reading Skills through Teacher-led Reading Practice
5.3 Glossary
5.3.1 Words
5.3.2 Phrases



5.4 Reading Comprehension
5.5 Critical Analysis
5.6 Creative Task
5.7 Grammar: Simple Future Tense
5.8 General Writing Skill: Circular-Writing
5.9 **Non-Detailed Text: Dickens, Charles. *Hard Times.***

**Unit-VI: *Hygiene**
6.0 Introduction
6.1 Objectives
6.2 Listening and Reading Skills through Teacher-led Reading Practice
6.3 Glossary
6.3.1 Words
6.3.2 Phrases
6.4 Reading Comprehension
6.5 Critical Analysis
6.6 Creative Task
6.7 General Writing Skill: Writing an Agenda for a Meeting
6.8 Grammar: Future Continuous Tense
6.9 **Non-Detailed Text: Dickens, Charles. *Hard Times.***

**Textbook**

1. Jayraj, S. Joseph Arul et al. *Trend-Setter: An Interactive General English Textbook for Under Graduate Students*. New Delhi: Trinity, 2016. Print.

**Non-Detailed Text:**

1. Dickens, Charles. *Hard Times.* Wordsworth: Printing Press, 1854. Print.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UGE320103 | | | | | Title of the Paper General English-III | | | | | | | | Hours 5 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.84 |
| CO2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.92 |
| CO3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.92 |
| CO4 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.84 |
| CO5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.84 |
| CO6 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.84 |
| | | | | | | | | | | | | Mean Overall Score | | | 4.86 |

**Result: The Score for this Course is 4.86 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester III** **Hours/Week: 8**
**17UPH330205** **Credits: 6**

## MATHEMATICAL PHYSICS

**Course Outcomes:**

1. The mathematical knowledge for the description of physical phenomena
2. Basic skills and appreciate physics through mathematics
3. Various numerical methods have been used to solve physics problems
4. Understanding the importance of line, surface and volume integrals and applies to solve physics problems
5. Understand the importance of Fourier Series and Fourier Transform
6. Applying the knowledge of Fourier Series and Fourier Transform to solve various wave functions
7. Acquire a knowledge of Beta and Gamma Functions
8. Learn to solve the differential equations of Legendre and Hermite polynomials of different order

### UNIT I: MULTIPLE INTEGRALS (12 Hrs)

Double Integrals – Properties – Evaluation – Change of variables: Double, triple integrals- Change of order of integration - Application of multiple integrals: (1) Area enclosed by plane curves (2) Volume and surface area as double integrals (3) volume as a triple integrals

### UNIT II: VECTOR CALCULUS (12 Hrs)

Differentiation of vector – Partial derivatives of a vector function – Grad, Div and curl – Physical significance – Line , surface and volume integrals – Gauss Theorem - Stokes Theorem - Green's Theorem - Physical Interpretation - Applications.

### UNIT III: FOURIER SERIES AND FOURIER TRANSFORM (12 Hrs)

Trignometric series – Fourier Formulae – periodic extension of a function – Fourier cosine and sine series – Properties of Fourier coefficients – Dirichlet's kernel – Convergence theorem - Applications (Half wave, Full wave, square wave, saw tooth and triangular wave) - Fourier Transform - Definition - Theorems -simple problems.

### UNIT IV: SPECIAL FUNCTIONS (12 Hrs)

Definitions - simple properties of Gamma, Beta functions - series solutions of Legendre and Hermite differential equations - Orthogonality properties, Generating functions and Rodrigue's Formula (Expressions only).

**UNIT V: NUMERICAL METHODS (12 Hrs)**

Transcendental Equation - Solving by Graphical Method - Newton Raphson method - Numerical Integration - Trapezoidal and Simpson's 1/3 rule-Numerical Method of solving differential equation - Euler's Method – Runge Kutta IV order method - applications.

**BOOKS FOR STUDY**


1. Babu Ram, Engineering Mathematics, Dorling Kindersley, Pearson Education, New Delhi, 2010
2. R. Murugeshan, Mechanics and Mathematical Physics, S.Chand, New Delhi, 3rd edition, 2008.
3. Sathiya Prakash, Mathematical Physics, S.Chand, New Delhi, 2nd edition, 2004.


| Unit | Book | Sections |
|---|---|---|
| I | 1 | Chapter 9 |
| II | 1 | Chapter 10 |
| III | 1 | 17.1-17.4, 17.7, 17.8, 17.10,17.15, 18.2, 18.4,18.5 |
| IV | 2 | 9.1-9.6, 9.8,9.11,9.12 |
| V | 3 | 13.6(a), 13.4(a, b), 13.5(a, e) |

**BOOKS FOR REFERENCE**


1. Demidowich, Problems inMathematical Analysis, MIR publications, Moscow 1976
2. Schaum's outline of vector Analysis, 2nd Edn. By Murray Spiegel, Seymour Lipschutz (McGraw-Hill 2009)
3. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers, 2000.
4. Advanced Engineering Mathematics by Erwin Kreyszig (Wiley Eastern Limited , 1985)




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UPH330205 | | | | Title of the Paper: MATHEMATICAL PHYSICS | | | | | | | | Hours 8 | Credits 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 3 | 2 | 3 | 4 | 5 | 3 | 4 | 1 | 5 | 5 | 1 | 3 | 3.3 |
| CO2 | 4 | 3 | 4 | 3 | 4 | 5 | 4 | 2 | 2 | 5 | 1 | 1 | 5 | 3.3 |
| CO3 | 4 | 5 | 4 | 4 | 2 | 4 | 3 | 5 | 2 | 5 | 1 | 3 | 4 | 3.5 |
| CO4 | 5 | 5 | 3 | 4 | 3 | 4 | 3 | 5 | 1 | 4 | 1 | 3 | 5 | 3.5 |
| CO5 | 5 | 5 | 4 | 3 | 5 | 4 | 3 | 3 | 1 | 4 | 1 | 4 | 5 | 3.5 |
| CO6 | 4 | 5 | 4 | 4 | 2 | 3 | 1 | 3 | 1 | 5 | 1 | 3 | 5 | 3.7 |
| CO7 | 5 | 5 | 4 | 2 | 2 | 5 | 3 | 3 | 1 | 5 | 1 | 3 | 4 | 3.4 |
| CO8 | 4 | 5 | 4 | 4 | 2 | 3 | 4 | 2 | 1 | 5 | 1 | 3 | 4 | 3.3 |
| | | | | | | | | | | | Mean Overall Score | | | 3.4 |

**Result: The Score for this Course is 3.4 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester III** **Hours/Week: 4**
**17UCH330403A** **Credits: 4**

**Allied:**
**CHEMISTRY-I**

**Course Outcomes**

1. Students learn the nomenclature, hybridization and isomerism
2. Students learn the intermediates of organic compounds
3. Students study the preparation, properties and mechanisms of alkanes and alkenes
4. Students understand the chemistry of hydrogen, some boron, silicon compounds, halogens and inter-halogen compounds
5. Students understand the principles of chemical kinetics
6. Students understand the principles of photochemistry

**Unit I: Hydrocarbons and Isomerism (12 Hours)**

Nomenclature of simple hydrocarbons. Hybridization – sp, $sp^2$, $sp^3$ (examples: acetylene, ethylene and methane). Bond length, bond angle, dipole moment, inductive effect, mesomeric effect and hyperconjugation effect. Solubility – protic and aprotic solvents. Isomerism – geometrical and optical isomerism, asymmetry, (R, S notation not necessary). Reactive intermediates – carbocation, carbanion and carbon free radicals (generation, structure and stability).

**Unit II: Alkanes and Alkenes (12 Hours)**

Methods of preparation of alkanes (Wurtz method, Kolbe's method, using Grignard reagent, Using HI/P), Chemical properties of alkanes - substitution reaction only (example: only halogenation of alkanes with free radical mechanism), conformation analysis of ethane, n-butane and cyclohexane.

Methods of preparations of alkenes (Kolbe's method, Hoffman degradation, using Lindlar's catalyst, Dehydration of alcohols, Dehydrohalogenation of alkyl halides), stereochemistry of dehydrohalogenation ($E_1$, $E_2$, $E_1CB$ mechanisms), Chemical properties of alkenes – electrophilic addition mechanism (example: only mechanisms of bromination of alkenes, hydrohalogenation of alkenes, hydration of alkenes and addition of diborane to alkenes)

**Unit III: Chemistry of Hydrogen, Halogen, Silicon and metals (12 Hours)**

Occurrence, extraction and chemical properties of iron, cobalt, nickel and copper. Electrochemical theory of rusting. Position of hydrogen in periodic table, atomic hydrogen and isotopes of hydrogen. Preparation and structure



of borozole, $SiO_2$, SiC and $SiCl_4$. General characteristics of halogens. Structures of inter halogens (XY, $XY_3$, $XY_5$, $XY_7$ type).

**Unit IV: Chemical Kinetics (12 Hours)**

Rate of reaction, factors affecting rate of the reaction, average and instantaneous rate, order, molecularity, pseudo first order reaction. Rate expression for first order and second order reactions. Expression of rate constant and half-life period for first order, second order (two molecules of same reactant), zero order reactions. Arrhenius and collision theories – assumption, derivation, demerits – experimental determination of order of reactions.

**Unit V: Photochemistry (12 Hours)**

Difference between photochemical reactions and dark reactions. Laws of photochemistry –Beer - Lambert's Law – Derivation and applications. Einstein law of photochemical equivalence. quantum yield. Kinetics of Hydrogen-chlorine reaction, Hydrogen-bromine reaction and decomposition of HI. Fluorescence, phosphorescence and chemi-luminescence.

**TEXT BOOK:**


1. Bahl B. R and ArunBahl. Organic Chemistry (12th edition), New Delhi, Sultan Chand & Co (1997)
2. Puri B. R.; Sharma L. R and Kalia K. K. Principles of Inorganic Chemistry, (23rd edition), New Delhi, ShobanLalNagin Chand & Co (1993)
3. Puri B. R.; Sharma L. R and Pathania M. S. Principles of Physical Chemistry, (23rd edition), New Delhi, ShobanLalNagin Chand & Co (1993)


**REFERENCES:**


1. Atkins P.W., Physical Chemistry, (7th edition) Oxford University Press, London (2009).
2. FinarI.L,Organic Chemistry, Vol 1&2, (6thedition) England, Addison WesleyLongmanLtd.(1996).
3. Lee J.D., Concise Inorganic Chemistry, UK, Black well science (2006).


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UCH330403A | | | | | Title of the Paper Allied: CHEMISTRY-I | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 3 | 2 | 3 | 5 | 5 | 3 | 3 | 3 | 3 | 1 | 2 | 3 | | 3.15 |
| CO2 | 4 | 3 | 3 | 2 | 5 | 4 | 4 | 3 | 3 | 4 | 1 | 2 | 3 | | 3.15 |
| CO3 | 4 | 3 | 1 | 3 | 5 | 5 | 4 | 3 | 3 | 4 | 1 | 2 | 3 | | 3.15 |
| CO4 | 5 | 3 | 2 | 2 | 5 | 5 | 5 | 3 | 3 | 4 | 1 | 2 | 3 | | 3.31 |
| CO5 | 4 | 3 | 2 | 3 | 5 | 5 | 5 | 3 | 3 | 3 | 1 | 2 | 4 | | 3.31 |
| CO6 | 5 | 3 | 2 | 3 | 5 | 4 | 5 | 4 | 3 | 4 | 2 | 2 | 3 | | 3.46 |
| | | | | | | | | | | | | Mean Overall Score | | | 3.25 |

**Result: The Score for this Course is 3.2 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester III** **Hours/Week: 4**
**17UCS330403A** **Credits: 4**

## Allied: Computer Science-I
## INTERNET AND DATABASE CONCEPTS

**Course Outcomes**

1. Know the concept behind the web and working of internet
2. Acquire the basic knowledge of designing web pages
3. Design colourful webpages and is able to create a basic website
4. Create web forms and fetch data meaningfully on the web
5. Learn the essence of Databases
6. Infer the skills to fetch and manipulate data through queries

**UNIT-I** **(12 hr)**

Introduction to the Internet : Computers in Business - Networking - Internet-Email - Resource Sharing -Gopher - WWW - Usenet - Telnet – BulletinBoard Service - Wide Area Information Service.

**UNIT-II** **(12)**

Introduction to HTML: Designing a home page - HTML document – Anchortag - Hyperlinks - Head and Body sections: Header section - Title – Prologue- links - colourful pages - comments - Body Section: Heading – Horizontalruler - Paragraph - Tabs - Images and pictures - Lists and their types - Nested lists - Table handling.

**UNIT-III** **(12)**

Frames - Frameset definition - Frame definition - Nested framesets. Formsand form elements.

**UNIT-IV** **(12)**

Database System Applications - Database Systems versus File Systems - View of Data - Data Models - Database Languages - Database Users andAdministrators - Transaction Management - Database System Structure -Application Architectures - History of Database Systems.

**UNIT-V** **(12)**

SQL Statements: Data Retrieval: SELECT, Data Definition Languages:CREATE, ALTER, DROP, RENAME, and TRUNCATE, Data ManipulationLanguage: INSERT - UPDATE, DELETE - MERGE. Transactional Control:COMMIT, ROLLBACK, SAVEPOINT, and Data Control Language: GRANT,REVOKE, SELECT ORDER BY - SELECT GROUP BY.

**BOOKS FOR STUDY**


1. C. Xavier, "World Wide Web Design with HTML", Tata McGraw Hill,2000.
2. Henry F. Korth Abraham Silberschatz , Database System Concepts,Fourth Edition McGraw Hill International Editions 2002.


**BOOKS FOR REFERENCE**


1. Wendy Willard, "Web Design - A beginners Guide", Tata McGraw Hill.
2. Thomas A. Powell, "The Complete Reference Web Design", Tata McGrawHill.
3. C.J. Date, An Introduction to Database System , seventh edition, PearsonEducation, New Delhi, 2002.




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UCS330403B | | | | | Title of the Paper Allied: COMPUTER SCIENCE-I | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 4 | | 3.6 |
| CO2 | 5 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | | 4.0 |
| CO3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | | 3.9 |
| CO4 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | | 3.5 |
| CO5 | 4 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | | 3.3 |
| CO6 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | | 3.7 |
| | | | | | | | | | | | | | Mean Overall Score | | 3.7 |

**Result: The Score for this Course is 3.7 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester III** **Hours/Week: 2**
**17UFC340901** **Credits: 2**

## ENVIRONMENTAL STUDIES

### Course Outcome

1. To ensure understanding the significance of environment in which we live.
2. To ensure imparting knowledge on the recent issues associated with environment.
3. To ensure educating the youth the causes and consequences of various types of pollutions.
4. To ensure sensitizing the youth the increasing threats to nature and the misery mankind faces.
5. To ensure the limitations of the available natural resources and the need to sustain them.
6. To ensure imparting the knowledge on the concept of biodiversity and its advantages.

### Unit-I: Environmental Studies

Environment - Scope and Importance - Environmental Movements in India - Eco-feminism - Public Awareness.

### Unit-II: Natural Resources

Food Resources - L and Resources - Forest Resources - Mineral Resources - Water Resources - Energy Resources

### Unit-III: Ecosystems, Biodiversity and Conservation

General structure - Functions of ecosystem - Energy flow and ecological pyramids - Biodiversity and conservation - Hot spots of Biodiversity - Endangered and Endemic Species - Value of Biodiversity - Threats to Biodiversity - Conservation of Biodiversity

### Unit-IV: Environmental Pollution

Air pollution - Water pollution - Oil pollution - Soil pollution - Marine pollution - Noise pollution - Thermal pollution – Radiation pollution

### Unit-V: Environment, Human Population & Social Issues

Human population growth - Urgent steps required for sustainable development - Conserving water - Current Environmental Issues

### Text Book:

1. **Environmental studies,** Department of Foundation course, St.Joseph's College, Tiruchirappalli-2, 2015.



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UFC340901 | | | | | Title of the Paper ENVIRONMENTAL STUDIES | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 5 | 5 | 5 | 3 | 5 | 4 | 4 | 4 | 5 | 3 | 4 | 3 | 4.0 | |
| CO2 | 5 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4.5 | |
| CO3 | 5 | 4 | 5 | 5 | 3 | 5 | 4 | 4 | 5 | 3 | 3 | 4 | 2 | 4.0 | |
| CO4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 3 | 4.2 | |
| CO5 | 5 | 5 | 4 | 5 | 4 | 3 | 5 | 5 | 4 | 4 | 5 | 3 | 4 | 4.3 | |
| CO6 | 5 | 5 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 2 | 4 | 3.7 | |
| | | | | | | | | | | | | | Mean Overall Score | | 4.1 |

**Result: The Score for this Course is 4.1 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester IV** **Hours/Week: 2**
**17UFC441004A** **Credits: 2**

## FORMATION OF YOUTH-II

**Course Outcome**

1. To ensure preparing the students to live in harmony with nature.
2. To ensure the youth the significance of public health and the related issues.
3. To ensure sensitizing the youth about addictions and their consequences.
4. To ensure educating the youth on disaster management and First-Aid.
5. To ensure enlightening on the developmental issues and challenges of youth today.
6. To ensure the value of counselling for attaining positive mental health.

**Unit-I: Harmony with Nature**

What is environment, Why should we think of harmony, Longing for human well-being, Principles to conserve environmental resources, Causes of disharmony, The fruits of harmony with nature, Forest resources, Water resources, Mineral resources, Food resources, Fruits of dishormony, Economic values and growth, Environmental Ethics, Guidelines to live in harmony with nature, Towards life-centered system for better quality of life

**Unit-II: Public Health**

Health related issues, Health Care in India vs Developed Countries, Health and Heredity, Public Health - The Indian Scenario, Objectives of public health in India, Public Health System in India, Failure on the public health front, Role of the central government, Hospitals Services in India, Health and Abortion, Health and Drug Addiction, Drug abuse

**Unit-III: Disaster Management and First-Aid**

Disaster Management, Types of disaster, Plans of disaster management, Technology to manage natural disasters and catastrophes, Disaster Management, Rehabilitation and Reconstruction, Human-induced disaster, First Aid, The importance of First-aid, Disaster Declaration and Response

**Unit-IV: Issues Dealing with Science**

What is Science, Science and Religion, Social Relevance of Science and Technology, Science and technology for social justice, Difference caused by Science and Technology, Need for indigenous technology, Science, Technology and Innovation Policy of India, Harnessing the forces of science and technology for the future



**Unit-V: Counselling for the Adolescents**

High Risk Behaviours, Developmental Changes in Adolescents, Key Issues of the Adolescents, Need for Counselling, Nature of Counselling, Counselling Goals, Does helping help? The Good and the Bad news.

**Text Book:**

1. **Formation of Youth,** Department of Foundation course, St.Joseph's College, Tiruchirappalli-2, 2016.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UFC441004A | | | | Title of the Paper FORMATION OF YOUTH-II | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 4 | 5 | 4 | 5 | 5 | 3 | 4 | 5 | 5 | 4 | 5 | 4 | 4.4 |
| CO2 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | 4.2 |
| CO3 | 5 | 3 | 5 | 4 | 5 | 4 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | 4.2 |
| CO4 | 3 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4.0 |
| CO5 | 2 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 4.3 |
| CO6 | 4 | 3 | 4 | 4 | 5 | 3 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 4.2 |
| | | | | | | | | | | | Mean Overall Score | | | 4.2 |

**Result: The Score for this Course is 4.2 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester IV** **Hours/Week: 2**
**17UFC441004B** **Credits: 2**

## RELIGIOUS DOCTRINE-II

**Course Outcome**

1. To ensure appreciation of the harmony of religion.
2. To ensure training the youth in the power of prayer.
3. To ensure the understanding of Mary's role in salvation history and Marian Dogmas.
4. To ensure enlightening the graces and invisible effects of the sacraments.
5. To ensure the youth with the promise that God forgives failings on repentance.
6. To ensure understanding the concept of salvation and the promise of eternal life.

**Unit: I Harmony of Religions**

Introduction - Religions of India - Buddhism - Jainism - Sikhism - Judaism - Confucianism - Christianity - Zoroastrianism - Islam

**Unit: II The Christian Prayer**

Prayer Defined - Reasons to pray - The Way to Pray - Types of Prayer - Obstacles for Prayer - Prayer in Old -The Lord's Prayer

**Unit: III Mary, the Blessed Virgin, Mother of God**

Introduction - Marian Dogmas - Mary in need of Redemption - Mary in the New Testament - Apparitions of Mary - Devotion to Mary

**Unit: IV Sacraments of Initiation**

Introduction - An Overview - Baptism - Confirmation - Holy Eucharist

Unit: V Sacraments of Healing & at the Service of the Community

Reconciliation - Anointing of the Sick - Holy Orders – Matrimony

**Text Book:**

1. **Life in the Lord,** Department of Foundation course, St. Joseph's College, Tiruchirappalli-2, 2011.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UFC441004B | | | | | Title of the Paper RELIGIOUS DOCTRINE-II | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 | |
| CO2 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 | |
| CO3 | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 4.2 | |
| CO4 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 | |
| CO5 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 3.8 | |
| CO6 | 4 | 1 | 4 | 3 | 3 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4.0 | |
| | | | | | | | | | | | | Mean Overall Score | | 3.9 | |

**Result: The Score for this Course is 3.9 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**பருவம்: 4** **மணி நேரம்: 4**

**17UGT410004** **புள்ளிகள்: 3**

## பொதுத்தமிழ்-IV

**பாடத்தின் விளைவு**

- நாடகத்தின் போக்குகள், உத்திகள், பாத்திரப்படைப்பு, உரையாடல் முறை, கற்பனைத்திறம் போன்றவற்றை அறிந்துகொள்ளுதல்.
- புதிய நாடகங்களைப் படைக்கும் திறனைப் பெறுதல்.
- நாடகங்களை நடிக்கும் திறன் பெறுதல்
- கிரேக்க, ஆங்கில நாடகங்களை அடியொற்றி தமிழ்நாடகம் தோன்றிய வரலாறு அறியச் செய்தல்.
- சங்ககாலம் தொட்டு இக்காலம் வரை காதல் பற்றிய உணர்வுகளை எடுத்துரைத்தல்.
- தமிழ் வரலாற்றின் மன்னர்களின் ஆட்சியின் சிறப்புகளையும் வீழ்ச்சிகளையும் எடுத்துக்காட்டுதல்.

**அலகு-1** **(12 மணி நேரம்)**

மனோன்மணீயம், பாயிரம், அங்கம் - 1, களம் 1 - 5 வரை.

**அலகு-2** **(12 மணி நேரம்)**

மனோன்மணீயம், அங்கம் - 2, களம் 1 - 3 வரை.

இலக்கிய வரலாறு நான்காம் பாகம் - தமிழும் பிற துறைகளும் பக்கம் (365-387).

**அலகு-3** **(12 மணி நேரம்)**

மனோன்மணீயம், அங்கம் - 3, களம் 1 - 4 வரை.

உரைநடை நாடகம் ( கௌதம புத்தர்)

**அலகு-4** **(12 மணி நேரம்)**

மனோன்மணீயம், அங்கம் - 4, களம் 1 - 5 வரை.

இலக்கிய வரலாறு நான்காம் பாகம் - சமயத்தவரின் தமிழ்ப்பணி (பக்கம் 391-402)

**அலகு-5** **(12 மணி நேரம்)**

மனோன்மணீயம், அங்கம் - 5, களம் 1 - 3 வரை.

இலக்கிய வரலாறு நான்காம் பாகம் - வெளிநாடுகள் தந்த தமிழ் இலக்கியம் (பக்கம் 410-435)

**பாடநூல்கள் :**


1. சுந்தரனார், மனோன்மணீயம், தமிழாய்வுத்துறை (பதிப்பு), தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2. (அங்கம் : 3 களம் : 4 நீங்கலாக)
2. பாலசுப்பிரமணியம். கு.வெ, கௌதம புத்தர், அய்யா நிலையம், தஞ்சாவூர்
3. சமூகவியல் நோக்கில் தமிழிலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, 2014.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UGT410004 | | | | | Title of the Paper பொதுத்தமிழ்-IV | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 4.5 | |
| CO2 | 5 | 4 | 3 | 5 | 4 | 5 | 5 | 4 | 4 | 3 | 4 | 5 | 5 | 4.3 | |
| CO3 | 4 | 3 | 3 | 5 | 4 | 3 | 3 | 4 | 3 | 3 | 4 | 5 | 5 | 3.7 | |
| CO4 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4.8 | |
| CO5 | 3 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4.1 | |
| CO6 | 4 | 3 | 4 | 5 | 5 | 4 | 3 | 3 | 4 | 3 | 2 | 2 | 3 | 3.4 | |
| | | | | | | | | | | | | | Mean Overall Score | | 4.1 |

**Result: The Score for this Course is 4.1 (Very High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semestre: IV** **Hours/Week: 4**
**17UGH410004** **Credits: 3**

## HINDI-IV

**Course Outcomes:**

At the end of the course, a student should be able to demonstrate…

* the ability to empower the students with globally employable soft skills
* the ability to translate Hindi passages to English
* the ideas on human values
* the ability to instruct the moral values given by the Bhakthi Saints
* the knowledge of Indian festivals .
* the knowledge of culture and tradition

**Unit-I** **8 hours**

Vidyarthi, Banking Shabda, Anuvad, Anuvad Lesson – 1, Adhikal, Premchand

**Unit-II** **12 hours**

Pusthakalaya, Nemikaryalaya Tippaniyan, Anuvadak, Anuvad lesson-2, Bakthikal-Gyan Marg, Mahadevivarma

**Unit-III** **12 hours**

Thyohar, Anuvad Ke Gun, Anuvad lesson – 3, Bakthi, Tippaniyaan, Prem Marg, Pant

**Unit-IV** **14 hours**

Yugpuresh Gandhi, Anuvadak Ke Gun, Anuvad Lesson – 4 Bakthikal, Bakthikal – Ram Bakthi Kal - Krishna Bakthi, Dinkar

**Unit-V** **14 hours**

Braman, Anuvad ek kala, Swarnayug Bakthikal, Anuvad Lesson - 5, Reetikal, Chayavad

**Books Recommended**


1. Kendriya Sachivalaya, Hindi Parishad New Delhi, Karyalaya Sahayika, 2016.
2. Dakshin Bharat Hindi Prachar Sabha Chennai-17, Niband Radhana, Hindi, 2016.
3. DBHP Sabha, Chennai-17, Anuvad Abyas-3, Hindi, 2016
4. Rajnath Sharma, Hindi Sahitya ka Itihas, Vinkod Pustak Mandir, Agra-2, 2016.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UGH410004 | Title of the Paper Hindi-IV | | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | |
| CO1 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 4 | 5 | 4 | 4 | 3.5 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 | 5 | 3 | 4 | 3 | 3 | 3.1 |
| CO3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 3 | 3.1 |
| CO4 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2.7 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 4 | 4 | 3.3 |
| CO6 | 4 | 4 | 4 | 4 | 3 | 5 | 3 | 5 | 4 | 4 | 3 | 3.9 |
| Mean Overall Score | | | | | | | | | | | | 3.3 |

**Result: The Score for this Course is 3.3 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semestre: IV** **Heures /Semaine: 4**
**17UGF410004** **Credits : 3**

## FRANÇAIS-IV

**Course Outcomes:**

- Comparer la culture de l'Inde et de la France
- Familiariser l'étudiant avec le vocabulaire, la grammaire et les conversations
- Connaître les auteurs français (20 auteurs) et leurs œuvres
- Dire qu'on aime quelqu'un/ quelque chose
- Demander des informations
- Exprimer une opinion personnelle et Justifier son opinion.

**Unit-I : Prières du Nouvel An** **(10 heures)**

Exprimer l'inquiétude, le regret, le souhait, l'obligation, la sympathie.

**Grammaire :** Le subjonctif, verbe craindre

**Unit-II : Retrouvailles** **(10 heures)**

Marquer la surprise

**Grammaire :** Le subjonctif, pronoms possessifs.

**Unit-III : C'est lui le meilleur ! (10 heures)**

Dire qu'on aime quelqu'un/ quelque chose, donner son opinion, insister.

**Grammaire :** Le superlatif, les pronoms démonstratif.

**Unit-IV Sauvons notre Terre !** **(15 heures)**

Enchaînement de cause et d'effet, demander à quelqu'un de tenir compté de quelque chose.

**Grammaire :** Le plus-que-parfait, il y a.

**Unit-V : Le jour des élections s'approche et les auteurs français (20 auteurs) et leurs œuvres** **(15 heures)**

Demander des informations, dire qu'une action n'est pas utile, exprimer une opinion personnelle, Justifier son opinion.

**Grammaire :** Le participe présent – le gérondif, la voix passive.

**Manuel**:

1. K.Madanagobalane, **Synchronie-II**, Samhitâ Publication, 2011.

**Livre de référence**:

1. Annie Berthet /B_atrix Sampsonis/ Catherine Hugot /V_ronnique M Kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006.
2. Yves Loiseau/R_gineM_rieux, Connexions 1, Didier, 2011.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UGF410004 | | | | | Title of the Paper French-IV | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 2 | 3 | 4 | 4 | 2 | 3 | 2 | 2 | 3 | | 3.0 |
| CO2 | 3 | 3 | 3 | 3 | 4 | 4 | 2 | 4 | 3 | 2 | 3 | | 3.1 |
| CO3 | 3 | 2 | 3 | 2 | 4 | 3 | 4 | 3 | 3 | 3 | 4 | | 3.1 |
| CO4 | 3 | 3 | 4 | 3 | 4 | 1 | 2 | 2 | 4 | 3 | 3 | | 2.9 |
| CO5 | 3 | 3 | 4 | 3 | 4 | 3 | 2 | 2 | 4 | 4 | 5 | | 3.4 |
| CO6 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 2 | 4 | 3 | 4 | | 3.4 |
| | | | | | | | | | | Mean Overall Score | | | 3.2 |

**Result: The Score for this Course is 3.2 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester: IV** **Hours/Week: 4**
**17UGS410004** **Credits : 3**

## SANSKRIT-IV

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* knowledge and understanding of the history of Sanskrit Drama.
* knowledge and understanding of the Nataka vivaranam.
* the introduction of Functional - Sanskrit conversation Letter writing.
* the ability to apply relevant theoretical perspectives to topics within the field of study
* the competence in academic writing and oral presentation skills.
* the ability to work both independently and in groups on presentations and/or development of Projects.

**Unit-I** **8 hours**

Paataah – Asta, Nava Dasha, Sankhya prayogah.

**Unit-II** **12 hours**

Lot lakaarah. Prqayaogah. Kartari Vaakyaani

**Unit-III** **12 hours**

Naatakasya Itihaasah.

**Unit-IV** **14 hours**

Karnabhaaram. Naatakam.

**Unit-V** **14 hours**

Kathaapaatra Vailaksharnyam.

**Books recommended:**


1. R.S.Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat 678003, Kerala, South India, History of Sanskrit Literature, 2014.
2. Samskritha Bharathi, Aksharam 8th Cross, 2nd Phase, Giri Nagar, Bangalore. Vadatu Sanskritam – Samskara Binduhu, 2014.
3. R.S. Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat 678003, Kerala, Soth India. Karnabharam, 2014.
4. Kulapathy, K.M., Saral Sanskrit Balabodh, Bharathiya vidya Bhavan, Munshimarg, Mumbai 400007, 2014.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UGS410004 | | | | | Title of the Paper Sanskrit-IV | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 5 | 3 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | | 3.1 |
| CO2 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 3 | | 3.1 |
| CO3 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | | 3.2 |
| CO4 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | | 3.1 |
| CO5 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | | 3.0 |
| CO6 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | | 3.2 |
| | | | | | | | | | | Mean Overall Score | | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester: IV** **Hours/Week: 5**
**17UGE420104** **Credits: 3**

## GENERAL ENGLISH-IV

**Course Outcome**

* Comprehend the local and global issues through the lessons
* Do the tasks centering on skill development and enhance their Grammar Using and Writing Skills
* Use interactive skills
* Train and develop the Listening and Reading Skills of the learners through teacher-led reading practice
* Improve their General Writing Skills such as Note-Taking, Note-Making, Précis Writing, Paragraph Writing, and Writing Short Essays on Current Issues/General Topics
* Understanding the social background and human character of the period

**Unit-VII:**

***Women through the Eyes of Media**

7.0 Introduction
7.1 Objectives
7.2 Listening and Reading Skills through Teacher-led Reading Practice
7.3 Glossary
7.3.1 Words
7.3.2 Phrases
7.4 Reading Comprehension
7.5 Critical Analysis
7.6 Creative Task
7.7 General Writing Skill: Writing Minutes of a Meeting
7.8 Grammar: Present Perfect Tense
7.9 **Non -Detailed Poem:** Thomas Hood (1799–1845): "Silence"

**Unit-VIII:**

***Effects of Tobacco Smoking**

8.0 Introduction
8.1 Objectives
8.2 Listening and Reading Skills through Teacher-led Reading Practice
8.3 Glossary
8.3.1 Words
8.3.2 Phrases

8.4 Reading Comprehension
8.5 Critical Analysis
8.6 Creative Task
8.7 General Writing Skill: Note-Taking
8.8 Grammar: Present Perfect Continuous Tense
8.9 **Non -Detailed Poem:** Coventry Patmore (1823-1896): "The Toys"

**Unit-IX:**

*** Short Message Service (SMS)**

9.0 Introduction
9.1 Objectives
9.2 Listening and Reading Skills through Teacher-led Reading Practice
9.3 Glossary
9.3.1 Words
9.3.2 Phrases
9.4 Reading Comprehension
9.5 Critical Analysis
9.6 Creative Task
9.7 General Writing Skill: Note-Making
9.8 Grammar: Past Perfect Tense
9.9 **Non -Detailed Poem:** Stephen Spender (1909-1995): "Daybreak"

**Unit-X:**

***An Engineer Kills Self as Crow Sat on his Head: A News Paper Report**

10.0 Introduction
10.1 Objectives
10.2 Listening and Reading Skills through Teacher-led Reading Practice
10.3 Glossary
10.3.1 Words
10.3.2 Phrases
10.4 Reading Comprehension
10.5. Critical Analysis
10.6. Creative Task
10.7 General Writing Skill: Précis Writing
10.8 Grammar: Past Perfect Continuous Tense
10.9 **Non -Detailed Poem:** Gabriel Imomotimi Okara (1921): "Once Upon a Time"



**Unit-XI:**

***Traffic Rules**

11.0 Introduction
11.1 Objectives
11.2 Listening and Reading Skills through Teacher-led Reading Practice
11.3 Glossary
11.3.1 Words
11.3.2 Phrases
11.4 Reading Comprehension
11.5 Critical Analysis
11.6 Creative Task
11.7 General Writing Skill: Paragraph Writing
11.8 Grammar: Future Perfect Tense
11.9 **Non -Detailed Poem:** Robert Winner (1930-1986): "Opportunity"

**Unit-XII:**

***A Handful of Answers: A Zen Tale**

12.0 Introduction
12.1 Objectives
12.2 Listening and Reading Skills through Teacher-led Reading Practice
12.3 Glossary
12.3.1 Words
12.3.2 Phrases
12.4 Reading Comprehension
12.5 Critical Analysis
12.6 Creative Task
12.7 General Writing Skill: Writing Short Essays on Current Issues/General Topics
12.8 Grammar: Future Perfect Continuous Tense
12.9 **Non -Detailed Poem:** Ted Hughes (1930–1998): "The Harvest Moon"

**Textbook**

1. Jayraj, S. Joseph Arul et al. *Trend-Setter: An Interactive General English Textbook for Under Graduate Students*. New Delhi: Trinity, 2016. Print.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UGE420104 | | | | | Title of the Paper General English-IV | | | | | | | Hours 5 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 4.61 |
| CO2 | 5 | 4 | 5 | 5 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4.69 |
| CO3 | 4 | 4 | 5 | 4 | 4 | 3 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 4.23 |
| CO4 | 4 | 4 | 5 | 4 | 4 | 3 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 4.30 |
| CO5 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 4.38 |
| CO6 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 4.61 |
| | | | | | | | | | | | | Mean Overall Score | | 4.47 |

**Result: The Score for this Course is 4.47 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester IV** **Hours/Week: 6**
**17UPH430206** **Credits: 4**

## ELECTRICITY AND MAGNETISM

**Course Outcomes**

1. Understand the fundamental principles of electrostatics, able to employ methods of calculus to calculate electric field from a distribution of charges.
2. Learn mathematical methods of Gauss' and Poisson, to calculate electric field for problems involving symmetry.
3. Acquire knowledge of magnetic field through the understanding of Ampere's law and apply it to compute the field in problems.
4. Understand Biot-Savart law and use to compute the field due to current carrying conductors.
5. Study Kirchoff's law and use it to analyze DC circuits.
6. To apply the basic knowledge of electromagnetic induction to explain observational phenomenon.

### UNIT-I: ELECTROSTATICS (12 hr)

Point charge – Rest charge – charge distributions – coulomb's law- vector form – Principle of superposition- electric field strength – Electric field due to a charged ring at an axial point- Electric dipole – The concept of a solid angle – Gauss theorem and its differential form – conservative nature of electric field – Potential difference –Evaluation of the field from potential- Potential due to a point charge- uniformly charged disc, spherical conductor - Poisson's and Laplace equations.

### UNIT-II: MAGNETO STATICS (12 hr)

Definition of B – Lorentz force – magnetic field intensity H – magnetic shell– Hall effect – Cyclotron – Ampere's circuital theorem – applications (Field at a point inside a long wire) – magnetic vector potential- magnetic susceptibility and relative permeability - classification of magnetic materials- Properties of magnetic materials – susceptibility determination (Gouy's method) – Experimental determination of hysteresis loop (Magnetometer method).

### UNIT-III: MAGNETIC EFFECTS OF CURRENT (12 hr)

Biot and Savart law – field due to a straight wire - field on the axis of a circular coil – field due to a solenoid- Torque on a current loop in a uniform field – force on a current carrying conductor in a magnetic field – Theory of

moving coil galvanometer – Applications of BG - Figure of merit – comparison of e.m.f of two cells and capacitances.

**UNIT-IV: CURRENT ELECTRICITY (12 hr)**

Current and current density – equation of continuity – resistance – Ohm's law – combination of resistance- star- Delta transformations – grouping of cells – Kirchoff's laws – Wheatstone Bridge – Carry–Foster's Bridge - Potentiometer – uses –Low resistance – growth and decay of current in inductor – charge and discharge of a capacitor through a resistance – Measurement of high resistance by leakage method – Physics of the LC Oscillator.

**UNIT-V: ELECTRO MAGNETIC INDUCTION & AC CIRCUITS (12 hr)**

Faraday's laws – differential form – induced current – charge – self inductance – self inductance of a long straight solenoid – Rayleigh's method of self-inductance– Mutual inductance – coefficient of coupling – Determination of mutual inductance using B.G – Earth inductor – Measurement of horizontal , vertical component of B and angle of dip – Dynamo – D.C generator - D.C Motor.

**BOOK FOR STUDY:**

1. Sehgal – Chopra- Sehgal, Electricity and magnetism, Sultan Chand and sons Ltd, New Delhi, 6th edition reprint, 2010.

| Unit | Book | Sections |
|---|---|---|
| I | 1 | 3.8 – 3.11, 3.15, 4.2, 4.4, 4.5, 4.9, 4.17, 4.20, 4.21. 5.2, 5.5, 5.8, 5.10, 5.14, 5.15, 5.22 |
| II | 1 | 13.19, - 13.21, 13.17, 13.23, 13.24, 13.29, 13.31, 13.33, 24.8, 24.9, 24.12 - 24.14. |
| III | 1<br>2 | 13.3, 13.5, 13.8, 13.9, 13.15, 14.4, 14.10,<br>9.10, 9.14, ------ |
| IV | 1 | 12.1, 12.3, 12.4, 12.6, 12.8, 12.10, 12.12 – 12.15, 12.17, 15.4, 15.9, 15.11.3, 20.3 – 20.6. |
| V | 1 | 19.3, 19.16, 19.17, 19.19, 19.22, 19.24, 19.25, 19.27, 19.28, 19.32, 19.35 – 19.37, 19.39-19.41. |

**BOOKS FOR REFERENCE:**


1. Introduction to electrodynamics David J Griffiths, Prentice Hall NJ (2000).
2. K KTewari, Electricity and magnetism, S. Chand & Co Ltd., NewDelhi, Reprint 2003.
3. Fundamentals of Physics David Halliday, Robert Resnick and Jearl Walker, Wiley NY (2015).




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UPH430206 | | | | | Title of the Paper: ELECTRICITY AND MAGNETISM | | | | | | | Hours 6 | Credits 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 2 | 3 | 4 | 3 | 4 | 4 | 1 | 1 | 4 | 2 | 4 | 3 | 3.00 |
| CO2 | 4 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 2 | 3 | 3.07 |
| CO3 | 3 | 3 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 2 | 3 | 3.38 |
| CO4 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 4 | 4 | 3 | 4 | 2 | 3 | 3.31 |
| CO5 | 4 | 3 | 3 | 4 | 2 | 3 | 4 | 3 | 4 | 4 | 3 | 2 | 3 | 3.23 |
| CO6 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 2 | 3 | 3.30 |
| | | | | | | | | | | | | Mean Overall Score | | 3.21 |

**Result: The Score for this Course is 3.2 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester IV** **Hours/Week: 3**
**17UPH430207** **Credits: 3**

## PHYSICS PRACTICAL-2

**Any 16 Experiments:**

1. Jollys bulb – pressure coefficient
2. K- Lees disc.
3. K- Forbes method.
4. y, n, ó – Searles method.
5. n and M.I – torsional pendulum.
6. Compound pendulum.
7. Kater's pendulum
8. Kundts tube.
9. Frequency – Melde's apparatus.
10. Young's modulus – uniform bending (scale and telescope).
11. Young's modulus – Koenig's method.
12. n- static method.
13. ç – Rankines method.
14. Spectrometer – i-d curve.
15. Spectrometer – i-i' curve.
16. Field along the axis of a coil – vibration magnetometer.
17. Potentiometer – ammeter calibration.
18. Potentiometer – R and ñ.
19. B.G. – comparison of mutual inductance.
20. B.G. – Resistance and figure of merit (condenser method).
21. Absolute M and H.
22. Junction diode and Zener diode characteristics.
23. Study of basic and universal gates (IC's).

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**Semester IV** **Hours/Week: 4**
**17UCH430404A** **Credits: 4**

## Allied:
## CHEMISTRY-II

**Course Outcomes**

1. Students learn the chemistry of carbohydrates
2. Students learn the chemistry of amino acids, proteins and benzene
3. Students study the theories of co-ordination compounds
4. Students study the applications of industrially important compounds
5. Students understand phase rule and adsorption
6. Students understand the principles and applications of electrochemistry

**Unit-I: Carbohydrates, amino acids, Proteins and Benzene (12 Hrs)**

Synthesis of carbohydrates - Photosynthesis, Classification of carbohydrates (based on hydrolysis and reducing nature), Characteristic reactions of the open chain aldehyde form and cyclic form of glucose, Characteristic reactions of the open chain ketone form and cyclic form of fructose, Uses of glucose and fructose, inter conversion of glucose to fructose, mutarotation.

Amino acids – Classification (based on acidic, basic groups), essential and non-essential amino acids, preparations (Gabriel synthesis, strecker synthesis, koop synthesis), zwitter ion formation, isoelectric point and its important in the separation of aminoacids, Chemical properties (reactions involving both amine group and carboxyl group) of glycine and alanine only, Proteins – Peptide linkage – primary, secondary and tertiary structure of proteins.

**Unit-II: Coordination Chemistry (12 Hrs)**

Nomenclature and isomerism of coordination compounds. EAN rule, VB and crystal field theories of octahedral, tetrahedral and square planar complexes. Chelation and its industrial applications. Magnetic studies – magnetic susceptibility, ferromagnetism and anti- ferromagnetism.

**Unit-III: Industrial Chemistry (12 Hrs)**

Silicones – preparation, properties and uses. Glass – manufacture and types. Cement – composition, manufacture and setting of cement. Ceramics – composition, types and preparation. Noble gases – hydrides, clathrates, structures of Xenon compounds ($XeF_2$, $XeF_4$, $XeF_6$, $XeOF_2$, $XeO_3$). Solutions – concentration of solutions (normality, molality and molarity definition only).

**Unit-IV: Phase rule and adsorption** **(12 Hrs)**

Phase rule – phase diagram of $H_2O$, $CO_2$, S, Pb-Ag systems. Adsorption – Langmuir and Frendluich adsorption isotherms (Derivation only). Applications of adsorption, only the principles of paper, TLC and column chromatography.

**UnitV: Electrochemistry** **(12 Hrs)**

Difference between Galvanic cell and Electrolytic cell; Types of electrodes - Metal – metal ion electrode, Gas electrode (hydrogen electrode), Metal – insoluble metal salt electrodes (calomel electrode), Oxidation – reduction electrode (quinhydrone electrode); Single electrode potential, Oxidation potential and reduction potential; Sign of electrode potential, Nernst equation (Derivation only); Reference electrode, Electrochemical series. Electromotive force (EMF), Potentiometric titrations – acid - base titrations, Redox titrations, precipitation titrations.

**TEXT BOOKS:**


1. Bahl B. R and ArunBahl. Organic Chemistry (12th edition), New Delhi, Sultan Chand & Co (1997)
2. Puri B. R.; Sharma L. R and Kalia K. K. Principles of Inorganic Chemistry, (23rd edition), New Delhi, ShobanLalNagin Chand & Co (1993)
3. Puri B. R.; Sharma L. R and Pathania M. S. Principles of Physical Chemistry, (23rd edition), New Delhi, ShobanLalNagin Chand & Co (1993)


**REFERENCES:**


1. Atkins P.W., Physical Chemistry, (7th edition) Oxford University Press, London (2009).
2. FinarI.L, OrganicChemistry, Vol1&2, (6th edition) England, Addison Wesley LongmanLtd.(1996).
3. Lee J.D., Concise Inorganic Chemistry, UK, Black well science (2006).




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UCH430404A | | | | | Title of the Paper Allied: CHEMISTRY-II | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 4 | 2 | 4 | 4 | 5 | 3 | 3 | 4 | 3 | 1 | 2 | 2 | 3.23 |
| CO2 | 5 | 4 | 1 | 5 | 5 | 4 | 4 | 3 | 3 | 4 | 1 | 2 | 2 | 3.31 |
| CO3 | 5 | 4 | 2 | 4 | 5 | 5 | 4 | 3 | 3 | 4 | 1 | 2 | 2 | 3.38 |
| CO4 | 5 | 4 | 1 | 4 | 4 | 5 | 5 | 3 | 3 | 4 | 1 | 2 | 3 | 3.38 |
| CO5 | 5 | 4 | 1 | 5 | 4 | 5 | 5 | 3 | 3 | 4 | 1 | 2 | 3 | 3.46 |
| CO6 | 5 | 4 | 2 | 5 | 5 | 4 | 5 | 4 | 3 | 4 | 2 | 2 | 2 | 3.62 |
| | | | | | | | | | | | | Mean Overall Score | | 3.39 |

**Result: The Score for this Course is 3.3 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester III & IV** **Hours/Week: 2**
**17UPH430405A** **Credits: 2**

**Allied:**

**CHEMISTRY PRACTICAL FOR PHYSICS**

**Course Outcomes:**

Students understand the principles of titrimetric analysis and organic qualitative analysis

**I. Volumetric Analysis**

1. Estimation of HCl (Std. oxalic acid x NaOH x HCl)
2. Estimation of NaOH (Std. $Na_2CO_3$ x HCl x NaOH )
3. Estimation of oxalic acid (Std. FAS x $KMnO_4$ x oxalic acid)
4. Estimation of FAS (Std. oxalic acid x $KMnO_4$ x FAS)
5. Estimation of $KMnO_4$ (Std. $K_2Cr_2O_7$ x FAS x $KMnO_4$)
6. Estimation of zinc (EDTA titration)
7. Estimation of magnesium (EDTA titration)
8. Estimation of hardness of water (EDTA titration)

**II. Organic Analysis**

a. Identification of acidic, basic, phenolic and neutral organic substances
b. Test for aliphatic and aromatic nature
c. Test for saturation and unsaturation
d. Detection of N, S and halogens.

**Reference:**


1. J. N. Gurtu and Kapoor.,*Experimental Chemistry*, S. Chand and Co. 1987.
2. N. S. Gnanapragasam and G. Ramamurthy, *Organic Chemistry – Lab Manual*, S. Viswanathan & Co. Pvt.Ltd., 1998.


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**Semester IV** **Hours/Week: 4**
**17UCS430404B** **Credits: 4**

**Allied: Computer Science-II**

**DATA AND COMMUNICATION NETWORKS**

**Course Outcomes:**

After learning this course, the learner would have

1. Familiarizethe students to understand the basic concepts of Data Communication
2. Understand the Classification of computer networks
3. Acquire the knowledge of Topology
4. Gets to know about the various types of networks
5. Learns the different transmission media
6. Infers the concept used in Mobile Communication technology

**Unit-I:** **(12 Hours)**

Data Communication Fundamentals: Analog Signal Transmission – Digital Signal Transmission. Data Transmission: Serial and Parallel Transmission – Communication Modes – Transmission Modes. Transmission Media: Twisted Pair – Coaxial Cable – Optical Fibers – Unguided Transmission Media.

**Unit-II:** **(12 Hours)**

Classification of Computer Networks: Classification by Geographical Spread – Topological Classification – Classification by Ownership. Switching and Routing: Circuit Switching – Message Switching – Packet Switching – Routing. Multiplexing and Concentration: Frequency Division Multiplexing – Time Division Multiplexing – Terminal Handling – Components of Computer Network.

**Unit-III:** **(12 Hours)**

Local Area Network: The Evolution of LAN – LAN Architecture: The OSI Model and LAN Access – LAN advantages and Services – Characteristics of LAN: The Server – Workstations – The Transmission Media for LAN – Communication Equipments. LAN Topologies: Bus and Tree – Ring Topology – Star Topology.

**Unit-IV:** **(12 Hours)**

Wireless LANs: Advantages of Wireless LANs – Components of Wireless LAN: Mobile Clients – Special Units – Working of Wireless LANs – Transmission Media: Radio Wave Technologies – Narrowband Technology.

Infrared Technology: Direct Modulation – Operating Modes – Benefits and Drawbacks – Wireless LAN Types: Ad hoc Wireless LAN – Infrastructure Wireless LAN.

**Unit-V:** **(12 Hours)**

Digital Cellular Radio: Global Systems for Mobile Communications – Cellular Digital Packet Data – Code Division Multiple Access. Bluetooth Technology: The Evolution – Goals and Features – Bluetooth products – Network Architecture – Hardware and Software Architecture – Applications.

**Book for Study:**

1. Rajesh, Eswarakumar, Balasubramanian, "Computer Networks, Fundamentals and Applications", Vikas Publishing House Pvt. Ltd., 2002.

**Book for Reference:**

1. William Stallings, "Data and Computer Communications", Prentice Hall of India, Seventh Edition, 2004.

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**Semester III & IV** **Hours/Week: 2**
**17UPH430405B** **Credits: 2**

**Allied:**

**COMPUTER SCIENCE PRACTICALS**
**(Software Lab - Web Design using HTML)**

**Course Outcomes:**

1. Simple web page with all the Text Formatting tags
2. Adding Images to WebPages
3. Creating Lists (Ordered and Unordered List)
4. Adding Links to Web Pages
5. Creating Tables using various attributes
6. Creating Frames
7. Designing forms using simple form elements
8. Implementation of Data Definition language commands
9. Implementation of DML, TCL and DCL commands

**Simple Projects using HTML**

1. Creating Web blocks consists of personal details
2. Creating Website for the Department/College



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UCS430404B | | | | | Title of the Paper Allied: COMPUTER SCIENCE-I | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 3 | 4 | 4 | 2 | 2 | 2 | 2 | 3 | 4 | 5 | 3 | 3 | 3.15 |
| CO2 | 5 | 2 | 4 | 5 | 4 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 2 | 3.3 |
| CO3 | 5 | 4 | 5 | 4 | 4 | 2 | 4 | 2 | 4 | 3 | 4 | 5 | 2 | 3.6 |
| CO4 | 4 | 2 | 5 | 4 | 2 | 2 | 2 | 2 | 5 | 3 | 4 | 4 | 2 | 3.1 |
| CO5 | 4 | 4 | 4 | 4 | 2 | 2 | 3 | 2 | 4 | 3 | 3 | 4 | 2 | 3.1 |
| CO6 | 4 | 4 | 4 | 4 | 4 | 2 | 3 | 2 | 4 | 3 | 3 | 5 | 3 | 3.4 |
| | | | | | | | | | | | | Mean Overall Score | | 3.3 |

**Result: The Score for this Course is 3.3 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester IV** **Hours/Week: 4**
**17UPH430301A** **Credits: 4**

**Core Elective-I (WS): ENERGY PHYSICS**

**Course Outcomes:**

1. Ability to know the power potential of the sun and its utility.
2. Understanding the experimental procedure of collecting solar energy.
3. Knowing various types of storage methods involving.
4. Knowing the other alternative sources for energy production.
5. Applying knowledge to fabricate solar cells for energy storage purpose.
6. Knowing other forms of energy which are existing in the nature.

**Unit I: Solar - Thermal Conversion (12 Hrs)**

An overview of thermal application and solar radiation – energy alternatives – devices for thermal collection and storage – thermal applications – Water heating – Space heating – Power generation – instruments for measuring solar radiation and sun shine

**Unit II: Performance of Flat-Plate Collectors (12 Hrs)**

Performance analysis - -Transmissivity of the cover system based on reflection - Refraction - Absorption - Transimissivity for diffuse radiation - Transmissivity - Absorptive product

**Unit III: Concentrating Collectors and Energy Storage (12 Hrs)**

General characteristics - Definitions - Methods of classifications - Thermal energy storage - Sensible heat storage - Liquids - Solids - Latent heat storage - Thermal chemical storage

**Unit IV: Photo Conversion (12 Hrs)**

Photovoltaic conversion - Single crystal silicon cell - Principle and working insular cells - Conversion efficiency - Single crystal silicon - Polycrystalline and amorphous silicon -Cadmium sulphide - Cadmium telluride - copper indium diselenide

**Unit V: Other Forms of Energy (12 Hrs)**

Wind energy - Recent developments - Energy from biomass - Direct methods - Indirect methods ~ Wave energy – Vegetation for fuel - Bio-diesel – Plants for Bio-diesel- Physical and chemical properties of Bio-diesel .

**Book for Study:**

1. P. Sukhatme, Solar energy (Second edition), Tata McGraw-Hill Publishing Co. Ltd. (New Delhi)

**Book for Reference:**

1. G.D.Rai, Solar Energy Utilization, Khanna publishers (New Delhi)



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UPH430301A | | | | | Title of the Paper: Core Elective-I (WS): ENERGY PHYSICS | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 3 | 2 | 3 | 4 | 4 | 4 | 3 | 3 | 2 | 3 | 3 | 1 | 3.00 | |
| CO2 | 4 | 2 | 1 | 2 | 3 | 4 | 3 | 4 | 2 | 1 | 4 | 3 | 2 | 2.69 | |
| CO3 | 4 | 3 | 3 | 3 | 4 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 1 | 3.30 | |
| CO4 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 1 | 4 | 3 | 1 | 3.15 | |
| CO5 | 3 | 4 | 2 | 3 | 3 | 3 | 4 | 3 | 4 | 2 | 3 | 3 | 2 | 3.00 | |
| CO6 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3.23 | |
| | | | | | | | | | | | | | Mean Overall Score | | 3.06 |

**Result: The Score for this Course is 3.1 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester IV** **Hours/Week: 4**
**17UPH430301B** **Credits: 4**

**Core Elective-I (WS): PHYSICS OF MATERIALS**

**Course Outcomes:**

1. Understanding the concept of materialclassifications based on the physical mechanism of energy conduction process and its associated theoretical knowledge.
2. Idea to form new materials for specific needs under controlled conduction of electric and thermal energies.
3. Inculcating the fundamentals ofoptics and specific use photo conducting behaviorwith an application towards renewable energy resources.
4. Conceptual idea of magnetic material clarifications.
5. Introducing the nanophase of materials with the knowledge of synthesis procedures and its need for modern applications.
6. Conceptual idea of nonlinearity, various nonlinear materials and their nonlinear behaviors towards modern optical communication.

**UNIT I: CONDUCTORS AND SUPERCONDUCTORS (12 Hrs)**

Electrical conduction - classification of conducting materials - free electron theory-expression for electrical conductivity - thermal conductivity - expression for thermal conductivity - Wiedemann Franz law - Introduction about superconductivity - general properties – types - applications.

**UNIT II: SEMICONDUCTORS AND DIELECTRICS (12 Hrs)**

Classification based on band theory - classification of semiconductors - elemental and compound semiconductors - structure and bonding in Si and Ge-applications - Introduction about dielectrics – definitions - different types of polarizations - types.

**UNIT III: OPTICAL PROPERTIES & PHOTOCONDUCTIVITY (12 Hrs)**

Introduction about optical properties - fundemental terms - classification – absorption – traps – excitons - colour centres - introduction about photoconductivity – charecteristics - photoconductor bias circuit – performance - applications.

**UNIT IV: MAGNETIC MATERIALS AND NANOPHASE MATERIALS (12 Hrs)**

Introduction about magnetic materials – definitions - types of magnetic materials - introduction about Nanophase materials – synthesis – charecteristics – properties - applications.



**UNIT V: NONLINEAR MATERIALS (12 Hrs)**

Introduction - basic principle – classification of nonlinear materials - nonlinear properties – polarization, higher harmonic generation, optical mixing, optical phase conjucation, optical rectification and phase matching – nonlinear materials - applications.

**BOOK FOR STUDY:**

1. Materials Science, V. Rajendran and A , Marikani Tata McGraw-Hill, New Delhi, Eleventh Reprint, 2010.

| Unit | Section |
|---|---|
| Unit I | 7.1-7.8,12.1-12.3,12.7 |
| Unit II | 9.1-9.6,6.1-6.3,6.5 |
| Unit III | 13.1-13.6,16.1-16.7 |
| Unit IV | 11.1-11.3,18.1-18.5 |
| Unit V | 24.1-24.5 |

**BOOKS FOR REFERENCE:**

1. V. Raghavan, Material Science and engineering, A first course, Prentice Hall Pvt.Ltd, New Delhi, 1989.
2. Dharmendra Kumar, SK Jain, AK Bhargava, Materials Science and Manufacturing Processes, Vikas Publishing

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UPH430301B | | | Core Elective-I (WS): PHYSICS OF MATERIALS | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 3 | 3 | 2 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 3 | 2 | 4 | 3.15 |
| CO2 | 5 | 4 | 5 | 4 | 3 | 4 | 4 | 2 | 4 | 4 | 2 | 4 | 4 | 3.77 |
| CO3 | 4 | 5 | 5 | 3 | 4 | 4 | 4 | 2 | 2 | 3 | 2 | 3 | 4 | 3.46 |
| CO4 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1.15 |
| CO5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 2 | 3 | 4 | 5 | 3.77 |
| CO6 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 2 | 2 | 4 | 4 | 3.54 |
| | | | | | | | | | | | | Mean Overall Score | | 3.14 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester IV** **Hours/Week: 4**
**17UPH430301C** **Credits: 4**

## Core Elective-I (WS):
## FUNDAMENTALS OF ELECTRICITY AND MAGNETISM

**Course Outcomes:**

1. Understand the fundamental principles of electrostatics, able to employ methods of calculus to calculate electric field from a distribution of charges.
2. Learn mathematical methods of Gauss' and Poisson, to calculate electric field for problems involving symmetry.
3. Acquire knowledge of magnetic field through the understanding of Ampere's law and apply it to compute the field in problems.
4. Understand the working of Multimeter, wattmeter and TG for measuring voltage and current.
5. Study Kirchoff's law and use it to analyze DC circuits.
6. To apply the basic knowledge of Maxwell's equation to explain observational phenomenon.

### UNIT-I: ELECTROSTATICS (12 Hrs)

Conductors and Insulators-Electric charge-properties-quantization-conversation-Millikan's experiment-coulomb's law-dielectric constant-electric field strength-units of electric field-electric field due to uniform line charge-electric dipole-electric field and charge within a conductor that has a static charge-capacitance and its units-energy of a charged capacitor

### UNIT-II: MAGNETIC EFFECTS OF CURRENT (12 Hrs)

Biot-Savart's law – experiments - applications - field along the axis of a circular coil-magnetic field due to solenoid-Determination of the sign of charge carriers: the Hall Effect

### UNIT-III: ELECTRICAL INSTRUMENTS (12 Hrs)

Tangent Galvanometer-force on a current carrying conductor in a uniform magnetic field-moving coil galvanometer-voltmeter-ammeter-multimeter-siemann's wattmeter-watt-hour meter

### UNIT-IV: ELECTROMAGNETIC INDUCTION (12 Hrs)

Faraday's experiments-faraday's laws of electromagnetic induction-Lenz's law-Fleming's right-hand rule-motional EMF-eddy currents-self-inductance-energy associated with an inductor-mutual inductance-motor-series and shunt motors.

**UNIT-V: MAXWELL'S EQUATIONS** **(12 Hrs)**

Introduction-fundamental laws of electromagnetism-Maxwell's equations-physical significance of Maxwell's equations-energy in electromagnetic waves: the poynting vector-waves in a conducting medium: the skin effect.

**BOOK FOR STUDY:**

1. Sehgal – Chopra- Sehgal, Electricity and magnetism, Sultan Chand and sons Ltd, New Delhi, 6th edition reprint, 2005

| Unit | Section |
|---|---|
| I | 3.1,3.2,3.4-3.7,3.10,3.12,4.2,4.4,4.9,4.28,6.7,7.5 |
| II | 13.2-13.5, 13.8, 13.9, 13.23 |
| III | 14.1, 14.2, 14.4-14.7, 14.13-14.15, 14.26, 14.27 |
| IV | 19.1-19.5, 19.7, 19.18-19.20, 19.25, 19.41, 19.42. |
| V | 26.1, 26.2, 26.6, 26.7, 26.9, 26.12. |

**BOOKS FOR REFERENCE**


1. K K.Tewari, Electricity and magnetism, S. Chand & Co Ltd., New Delhi, Reprint 2003.
2. Introduction to electrodynamics David J Griffiths, Prentice Hall of India Pvt. Ltd., New Delhi, 3rd Edition
3. Fundamentals of Physics David Holliday, Robert Resnick and Jearl Walker, Wiley NY(2015).




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UPH43030IC | Title of the Paper Core Elective-I (WS): FUNDAMENTALS OF ELECTRICITY AND MAGNETISM | | | | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 2 | 3 | 4 | 3 | 4 | 4 | 1 | 1 | 4 | 3 | 4 | 3 | 3.07 |
| CO2 | 4 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 3 | 3.23 |
| CO3 | 3 | 3 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 2 | 3 | 3.38 |
| CO4 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 4 | 4 | 3 | 4 | 2 | 2 | 3.23 |
| CO5 | 4 | 3 | 3 | 4 | 2 | 3 | 4 | 3 | 4 | 4 | 3 | 2 | 3 | 3.23 |
| CO6 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 2 | 3 | 3.30 |
| | | | | | | | | | | | Mean Overall Score | | | 3.24 |

**Result: The Score for this Course is 3.2 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester IV** **Hours/Week: 2**
**17UFC441004A** **Credits: 2**

## FORMATION OF YOUTH-II

**Course Outcome**

1. To ensure preparing the students to live in harmony with nature.
2. To ensure the youth the significance of public health and the related issues.
3. To ensure sensitizing the youth about addictions and their consequences.
4. To ensure educating the youth on disaster management and First-Aid.
5. To ensure enlightening on the developmental issues and challenges of youth today.
6. To ensure the value of counselling for attaining positive mental health.

**Unit-I: Harmony with Nature**

What is environment, Why should we think of harmony, Longing for human well-being, Principles to conserve environmental resources, Causes of disharmony, The fruits of harmony with nature, Forest resources, Water resources, Mineral resources, Food resources, Fruits of dishormony, Economic values and growth, Environmental Ethics, Guidelines to live in harmony with nature, Towards life-centered system for better quality of life

**Unit-II: Public Health**

Health related issues, Health Care in India vs Developed Countries, Health and Heredity, Public Health - The Indian Scenario, Objectives of public health in India, Public Health System in India, Failure on the public health front, Role of the central government, Hospitals Services in India, Health and Abortion, Health and Drug Addiction, Drug abuse

**Unit-III: Disaster Management and First-Aid**

Disaster Management, Types of disaster, Plans of disaster management, Technology to manage natural disasters and catastrophes, Disaster Management, Rehabilitation and Reconstruction, Human-induced disaster, First Aid, The importance of First-aid, Disaster Declaration and Response

**Unit-IV: Issues Dealing with Science**

What is Science, Science and Religion, Social Relevance of Science and Technology, Science and technology for social justice, Difference caused by Science and Technology, Need for indigenous technology, Science,



Technology and Innovation Policy of India, Harnessing the forces of science and technology for the future

**Unit-V: Counselling for the Adolescents**

High Risk Behaviours, Developmental Changes in Adolescents, Key Issues of the Adolescents, Need for Counselling, Nature of Counselling, Counselling Goals, Does helping help? The Good and the Bad news.

**Text Book:**

1. **Formation of Youth,** Department of Foundation course, St.Joseph's College, Tiruchirappalli-2, 2016.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UFC441004A | | | | | Title of the Paper FORMATION OF YOUTH-II | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 4 | 5 | 4 | 5 | 5 | 3 | 4 | 5 | 5 | 4 | 5 | 4 | | 4.4 |
| CO2 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | | 4.2 |
| CO3 | 5 | 3 | 5 | 4 | 5 | 4 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | | 4.2 |
| CO4 | 3 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | | 4.0 |
| CO5 | 2 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | | 4.3 |
| CO6 | 4 | 3 | 4 | 4 | 5 | 3 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | | 4.2 |
| | | | | | | | | | | | | | Mean Overall Score | | 4.2 |

**Result: The Score for this Course is 4.2 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester IV** **Hours/Week: 2**
**17UFC441004B** **Credits: 2**

## RELIGIOUS DOCTRINE-II

**Course Outcome**

1. To ensure appreciation of the harmony of religion.
2. To ensure training the youth in the power of prayer.
3. To ensure the understanding of Mary's role in salvation history and Marian Dogmas.
4. To ensure enlightening the graces and invisible effects of the sacraments.
5. To ensure the youth with the promise that God forgives failings on repentance.
6. To ensure understanding the concept of salvation and the promise of eternal life.

**Unit: I Harmony of Religions**

Introduction - Religions of India - Buddhism - Jainism - Sikhism - Judaism - Confucianism - Christianity - Zoroastrianism - Islam

**Unit: II The Christian Prayer**

Prayer Defined - Reasons to pray - The Way to Pray - Types of Prayer - Obstacles for Prayer - Prayer in Old -The Lord's Prayer

**Unit: III Mary, the Blessed Virgin, Mother of God**

Introduction - Marian Dogmas - Mary in need of Redemption - Mary in the New Testament - Apparitions of Mary - Devotion to Mary

**Unit: IV Sacraments of Initiation**

Introduction - An Overview - Baptism - Confirmation - Holy Eucharist

Unit: V Sacraments of Healing & at the Service of the Community

Reconciliation - Anointing of the Sick - Holy Orders – Matrimony

**Text Book:**

1. **Life in the Lord,** Department of Foundation course, St. Joseph's College, Tiruchirappalli-2, 2011.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UFC441004B | | | | Title of the Paper RELIGIOUS DOCTRINE-II | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 |
| CO2 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 |
| CO3 | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 4.2 |
| CO4 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 |
| CO5 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 3.8 |
| CO6 | 4 | 1 | 4 | 3 | 3 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4.0 |
| | | | | | | | | | | | | Mean Overall Score | | 3.9 |

**Result: The Score for this Course is 3.9 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester V** **Hours/Week: 5**

**17UPH530208** **Credits: 4**

## 'C' PROGRAMMING FOR PHYSICS

**Course Outcomes:**

1. Understand the lexical elements in 'c'- programming.
2. Be aware of different types of operators and expressions in c language.
3. Choose the loops and decision making statements to solve the problem
4. Implement different operation an arrays.
5. Use function to solve the given problems
6. Understand pointers, structures and unions.

### UNIT-I: DATA TYPES, OPERATORS AND EXPRESSIONS (12 Hrs)

Structure of C language – Lexical elements of C language: C character set – constants – keywords – delimeters – variables – data types and sizes – variable declaration – labels – expressions – statements. Operators and Expressions: Arithmetic operators– relational operators – logical operators – assignment operators – increment and decrement operators-conditional operator-bitwise operators-special operators-arithmetic expressions-evaluation of expressions-precedence of arithmetic operators-type conversions in expressions-operator precedence and associativity.

| | | |
|---|---|---|
| G | Temperature conversion from Centigrade to Fahrenheit, Kelvin scales | Assignment statements |
| P | Period of Oscillations of Simple pendulum inside a lift up-down | -Do - |
| M | Computation of mathematical quantity for a given radius value | -Do - |

### UNIT-II: I/O AND CONTROL STATEMENTS (12 Hrs)

Input / Output in C: input functions – output functions – formatted input / output.Controlstructures: Unconditional control – bidirectional conditional control – multi conditional control – loop control structures.

| | | |
|---|---|---|
| G | Cost of operating electrical devices | for structure |
| P | Young's and Rigidity Modulus | do- while structure |
| M | Solution to the general Quadratic equation Preparation of Multiplication Table Newton-Raphson method applied to Physics Problem | If – else structure for structure any loop structure |

**UNIT-III: ARRAYS, STRINGS AND FUNCTIONS (12 Hrs)**

Arrays declaration – multidimensional array - array initialization – rules to initialize an array – strings/character arrays – rules.

C functions: Library functions – user defined functions – advantages of the functions – arguments – function declaration – recursive functions – storage class specifiers - scope of the variables – scope rules for identifiers

| | | |
|---|---|---|
| G | Conversion of all small case letters in to capital letters | Use of strings |
| P | Field along the axis of the coil | Use of arrays |
| M | Matrix: Addition, Subtraction, Multiplication and Inverse of any order | Use of arrays |
| G | Arranging a series of numbers into ascending / descending order | Use of function |
| P | Trapezoidal Rule applied to Physics Problem | Use of function |
| M | To find the value of e up to n terms<br>To find the function value f(x) with 3 boundary conditions<br>To find the factorial of a given number | - Do - |

**UNIT-IV: STRUCTURES AND UNIONS (12 Hrs)**

Structure: declaration and period operator – structure initialization – arrays of structures – arrays within structures– structure within structure-structures and functions. Union: Rules to use union

| | | |
|---|---|---|
| G | Construct of structure with Hour, Minute, Second as structure member - Convert to Military time | Use of Structure |
| P | Sum, Difference and Modulus of two complex numbers | Use of Structure |

**UNIT-V: POINTERS AND FILES (12 Hrs)**

Pointers: declaring a pointer variable – address operator – pointer arithmetic – pointers as function parameters – passing parameters by reference – pointers and arrays.

Files: data types – with fopen(), modes in fopen(), with fclose() – random access

| | | |
|---|---|---|
| M | Sort n numbers in ascending order using Bubble Sort technique | Use of Pointers |
| P | Input/Output operations on files | Use of fi;es |

**BOOK FOR STUDY:**

1. E. Balagurusamy, Programming in ANSI C, Sixth Edition, McGraw Hill Education(India)Private Limited, New Delhi.



| Unit | Section |
|---|---|
| I | 1.8, 1.9, 2.1 –2.13, 3.1 – 3.12, 3.14, 3.15 |
| II | 4.1 - 4.5, 5.1-5.9, 6.1 – 6.6 |
| III | 7.1 – 7.7, 8.1-8.8, 9.1 - 9.19 |
| IV | 10.1-10.12 |
| V | 11.1 – 11.17, 12.1 – 12.6 |

**BOOKS FOR REFERENCE:**

1. Schaum's Outlines : Programming with C , Byron S. Gottfried, Tata McGraw Hill Pub. Co Ltd., New Delhi, 5/e, 2007
2. Yashvant Kanetkar, Programming with C,2nd edition, Tata McGraw Hill, New Delhi,1998.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UPH530208 | | | | | Title of the Paper 'C' PROGRAMMING FOR PHYSICS | | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 5 | 2 | 4 | 5 | 5 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | | 3.3 |
| CO2 | 4 | 4 | 2 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 4 | 3 | 3 | | 3.6 |
| CO3 | 4 | 5 | 2 | 4 | 4 | 4 | 3 | 4 | 5 | 4 | 4 | 2 | 4 | | 3.7 |
| CO4 | 4 | 3 | 2 | 4 | 3 | 4 | 3 | 4 | 5 | 4 | 4 | 2 | 4 | | 3.3 |
| CO5 | 4 | 3 | 2 | 4 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | | 3.2 |
| CO6 | 4 | 4 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 2 | 3 | | 3.3 |
| | | | | | | | | | | | | | Mean Overall Score | | 3.4 |

**Result: The Score for this Course is 3.4 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester V** **Hours/Week: 6**

**17UPH530209** **Credits: 4**

## ATOMIC, SOLID STATE AND NUCLEAR PHYSICS

**Course Outcomes:**

1. Understand the evolution of different atomic models and their merits and limitations.
2. Ability to analysis the effect of applied magnetic and electric fields of atomic spectra.
3. Understand the basic knowledge of crystals and superconductors.
4. Ability to analysis the different types of crystals systems.
5. Understand the basic properties of nuclei and different nuclear models
6. Acquiring the knowledge of different accelerators and their advantages and their limitations.

### UNIT -I: ATOMIC PHYSICS (12 Hrs)

Bohr atom model-hydrogen spectrum - Sommerfeld's relativistic atom model - vector atom model - quantum numbers associated with the vector atom model - coupling schemes - Pauli exclusion principle - periodic classification of elements - magnetic dipole moment (due to orbital motion of the electron and due to spin) - Stern and Gerlach experiment - spin orbit coupling - Optical spectra - Zeeman effect - Lorentz classical theory of normal effect, shift, experiment - Larmor's theorem - quantum mechanical explanation of the normal and anomalous effect - Paschen Back effect - Stark effect.

### UNIT - II: SOLID STATE PHYSICS (12 Hrs)

Periodicity - Lattice, Basis, Unit cell, crystal structure –Elements of symmetry, bravais lattices –miller indices- symmetry elements - 2D and 3D Bravais lattices - bonding in crystals - different types and their properties - band theory of solids - specific heat capacity: Einstein's theory and Debye's theory - Superconductivity - experimental facts - persistent current - Type I - Type II - Meissner effect - BCS theory - applications.

### UNIT - III: NUCLEUS AND RADIOACITIVITY (12 Hrs)

Classification of nuclei - General properties - binding energy - nuclear stability - theories of nuclear composition - nuclear forces - models of nuclear structure - liquid drop model and shell model - Alpha particle spectra - Beta ray spectra - origin of the line and continuous spectrum - neutrino theory of beta decay - origin of gamma ray spectra - Nuclear isomerism- internal conversion - law

of successive disintegration - radioactivity dating - Biological effect of nuclear radiations.

**UNIT-IV: PARTICLE DETECTORS, ACCELERATORS AND COSMIC RAYS (12 Hrs)**

Particle detectors - interaction between energetic particles and matter - Wilson Cloud chamber – ionization chamber, solid state detectors, proportional counter -Geiger Muller Counter - nuclear emulsion technique – Particle accelerators - Cyclotron - Betatron - Synchrotron - electron synchrotron and proton synchrotron - Discovery - Cosmic Rays - latitude, azimuth, altitude and longitude effects - primary and secondary cosmic rays - showers - positron - mesons - Van Allen belts - origin of cosmic rays.

**UNIT-V: ELEMENTARY PARTICLE PHYSICS (12 Hrs)**

Classification-Particles and anti particles-Antimatter-Fundamental interaction -Elementary particle Quantum numbers-Conservation laws and symmentry-Quarks model

**BOOK FOR STUDY:**

1. R. Murugeshan., Kiruthiga Sivapasath. Modern Physics, S. Chand & Co., Sevententh Revised Multicoloured Edition, New Delhi, 2014.

| Unit | Book | Sections |
|---|---|---|
| I | 1 | 6.11-6.28 |
| II | 1 | 7.16-7.19,41.1-41.6,41.10-41.15 |
| III | 1 | 27.2,31.13-31.14,31.19-31.27,31.34-31.36 |
| IV | 1 | 29.3,29.7,29.11,30.6-30.8,37.1-37.11 |
| V | 1 | 38.1-38.7 |

**BOOKS FOR REFERENCE:**


1. Arthur Beiser, Concepts of Physics, Tata McGraw - Hill - Sixth Edition, 2003.
2. Sehgal Chopra Sehgal - Modern Physics, Sultan Chand Sons, New Delhi, 2004.
3. Sanjiv and Puri, Modern Physics Concepts and Application, Narosa Publication, New Delhi-2004.




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UPH530209 | | | | | Title of the Paper ATOMIC, SOLID STATE AND NUCLEAR PHYSICS | | | | | | | | Hours 6 | Credits 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 5 | 2 | 2 | 4 | 5 | 4 | 3 | 2 | 3 | 2 | 2 | 2 | | 3.2 |
| CO2 | 5 | 3 | 2 | 2 | 4 | 5 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | | 3.1 |
| CO3 | 4 | 4 | 2 | 3 | 4 | 5 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | | 3.2 |
| CO4 | 4 | 5 | 2 | 5 | 4 | 4 | 4 | 3 | 4 | 4 | 2 | 2 | 5 | | 3.5 |
| CO5 | 5 | 3 | 3 | 3 | 4 | 5 | 4 | 3 | 3 | 3 | 2 | 2 | 3 | | 3.3 |
| CO6 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | | 3.2 |
| | | | | | | | | | | | | Mean Overall Score | | | 3.2 |

**Result: The Score for this Course is 3.2 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester V** **Hours/Week: 5**
**17UPH530210** **Credits: 4**

## ANALOG ELECTRONICS

**Course Outcomes:**

1. Acquire basic knowledge of p-n junction diode, different rectification process, filtering techniques
2. Understanding Thevenine's theorem and procedure for finding Thevenin equivalent circuit and to gain knowledge of Maximum Power theorem
3. Acquiring Knowledge on Fabricationof a transistor, different configuration, Biasing, h parameters and Finding different applications of FET
4. Studying the amplitude and frequency response of common amplification circuits
5. Applying theories for different classes of amplifiers, observation of Band width, understanding different coupling networks
6. Understanding negative and positive feed backs

**UNIT-I: Diode Characteristics and Applications (12 Hrs)**

Constant voltage source - constant current source - Maximum power transfer theorem - Thevenine's theorem - procedure for finding Thevenin Equivalent circuit - PN junction theory - V-I characteristics of a PN junction diode - Half wave rectifier - Bridge rectifier - Efficiency - filters - Shunt capacitor filter – pi filter - Zener diode - equivalent circuit - voltage regulator - LED - V-I characteristics – advantages - applications - photo diode - characteristics - applications.

**UNIT-II: Transistor Characteristics and Biasing Techniques (12 Hrs)**

Junction transistor structure –transistor action - transistor as an amplifier– transistor connections and characteristics : CB, CE, CC - comparison- basic CE amplifier - operating point – biasing- stabilization - requirements of a biasing circuit –stability factor-base resistor method - voltage divider bias method– h parameter equivalent circuits –performance of linear circiuts - JFET – principle and working - symbol - comparison with bipolar transistor - output characteristics - shorted gate drain current, pinch off voltage and gate source cut off voltage - JFET parameters.

**UNIT-III: Ingle Stage, Multistage and Power Amplifiers (12 Hrs)**

Single stage CE transistor amplifier - JFET amplifier - multistage amplifier – gain-frequency response –decible gain-bandwidth-RC and transformer



coupled amplifier-direct coupled amplifier-comparison-o/p power of amplifier-performance quantities- classification of power amplifiers –collector efficiency–series fed class Aamplifier- push pull amplifier.

**UNIT-IV: Feedback Amplifiers and Oscillators (12 Hrs)**

Feedback - Types - voltage and current feedback in amplifiers –principles-gain - advantages –Emitter follower- classification of oscillators - positive feedback amplifier as an oscillator - Hartley oscillator Colpittsoscillator - Phase shift and Wien's bridge - Crystal oscillators – Astable-Bistable multivibrator.

**UNIT-V: Switching Circuits & Integrated Circuits (12 Hrs)**

Clipping and clamping circuits - SCR: working - equivalent circuit - important terms - V-I characteristics –switching- Integrated circuits - advantages and disadvantages –classification-making monolithic IC -fabrication of components on monolithic IC- Operational amplifier - differential amplifier - basic circuit - operation - common mode and differential mode signals - voltage gains - CMRR- Schematic symbol of OP AMP - output voltage - OP-AMP with negative feedback - inverting amplifier - Non inverting amplifier - Voltage follower - summing amplifiers and applications - Integrator and differentiator

**Books for Study:**

1. V.K. Mehta and Rohit Mehta, Principles of Electronics, S. Chand & Co. Ltd, New Delhi, 2016.

| Unit | Sections |
|---|---|
| I | 1.9, 1.10, 1.12-1.14, 5.14-5.19, 6.8-6.15, 6.18-6.21, 6.25-6.27, 7.2-7.10 |
| II | 8.1-8.14, 8.16-8.18, 8.20, 9.2, 9.4-9.6, 9.8, 9.12, 24.1-24.4, 19.1-19.6, 19.8-19.10, 19.12, 19.13 |
| III | 10.1-10.9, 11.1, 11.3, 11.5-11.8, 12.1, 12.3,12.5-12.8, 12.17, 12.18, 19.21-19.24 |
| IV | 13.1-13.11, 14.1-14.3, 14.5-14.7, 14.10-14.20, 18.10,18.11, 18.12, 18.14 |
| V | 18.18, 18.20, 18.21-18.23, 20.1-20.5, 20.7, 20.8, 23.1, 23.2,23.4-23.6, 25.1-25.5, 25.7, 25.8, 25.15, 25.16, 25.17,25.22, 25.24, 25.25, 25.26, 25.26, 25.32, 25.33, 25.34, 25.35, 25.37 |

**Book for Reference:**

1. Bhargava N.N, Kulshreshtha D.C and S.C Gupta - Basic electronics and linear circuits, Tata McGraw Hill Publishing Company Limited, 2007.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UPH530210 | | | Title of the Paper ANALOG ELECTRONICS | | | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 1 | 2 | 1 | 4 | 5 | 5 | 4 | 4 | 3 | 4 | 2 | 1 | 1 | 3.08 |
| CO2 | 1 | 1 | 1 | 4 | 5 | 3 | 4 | 2 | 3 | 5 | 1 | 1 | 2 | 2.66 |
| CO3 | 2 | 2 | 1 | 5 | 5 | 5 | 4 | 4 | 3 | 3 | 3 | 1 | 3 | 3.42 |
| CO4 | 3 | 5 | 1 | 5 | 5 | 5 | 4 | 3 | 3 | 4 | 5 | 1 | 4 | 4.00 |
| CO5 | 2 | 4 | 1 | 5 | 5 | 4 | 5 | 5 | 4 | 3 | 2 | 1 | 3 | 3.66 |
| CO6 | 1 | 4 | 1 | 4 | 5 | 4 | 5 | 3 | 3 | 3 | 2 | 1 | 3 | 3.25 |
| | | | | | | | | | | | | Mean Overall Score | | 3.34 |

**Result: The Score for this Course is 3.3 (High Relationship)**



***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling*:**

| **Mean Score of COs** = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$ | **Mean Overall Score for COs** = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$ |
|---|---|

**Semester V** **Hours/Week: 6**
**17UPH530211** **Credits: 3**

## PHYSICS PRACTICAL-III

**Any 16 Experiments:**

1. Spectrometer – grating – normal incidence.
2. Spectrometer – grating – minimum deviation.
3. M – using coil carrying current – Cu voltammeter.
4. M – using coil carrying current – ammeter.
5. Determination of Stefan's constant.
6. Earth inductor.
7. Fresnel's biprism.
8. B.G. - absolute M.
9. B.G – absolute C
10. Zener regulated power supply.
11. Clipping and clamping.
12. Conversion of galvanometer into an ammeter.
13. Conversion of galvanometer into voltmeter.
14. Transistor characteristics – CB.
15. Transistor characteristics – CE.
16. FET – characteristics.
17. Hartley oscillator.
18. Colpitts oscillator.
19. Study of transistor CE amplifier.
20. Study of FET amplifier.
21. Logic gates – by discrete components.
22. De-Morgans theorem and Boolean algebra.
23. Specific Rotation of Sugar solution by Polarimeter.

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**Semester V** **Hours/Week: 4**
**17UPH530302A** **Credits: 4**

**Core Elective-2 (WD):**
**PHOTOGRAPHY AND VIDEOGRAPHY**

**Course Outcomes**

1. Students acquire knowledge of parts of cameras and types of cameras
2. Students understands the importance of exposure and pictorial composition
3. Students create, select, and apply appropriate techniques and editing tools for editing and printing
4. Students learn to produce a good quality photo using adope photo software
5. Students acquire the knowledge of different parts of video cameras and its accessories
6. should have the capability to comprehend the technological advancements in the usage of modern design tools to edit ,print and design for variety of applications.

**UNIT-I: FUNDAMENTALS OF PHOTOGRAPHY & CAMERA (12 Hrs)**

Film and Digital Photography - Basic parts of the camera, types ofcamera-Box camera, simple miniature camera, Modern reflex camera-TLR, SLR andDigital cameras

**UNIT-II: EXPOSURE AND PICTORIAL COMPOSITION (12 Hrs)**

Exposure for photographing in artificial light, depth of field, depth of focus,exposure for taking photographs of moving subjects -shutter speed formoving objects-panning-practical hints for exposing.

**UNIT-III: EDITINGAND PRINTING (12 Hrs)**

Photo editing software – Photoshop – size of the photo – adjustments – layers – filters - selection - cropping – healing – red eye removal – clone – dodge and burn – tittle - panoramas - file formats – saving the photos.

**UNIT IV : VIDEO CAMERA (12 Hrs)**

Principle of Television - Colour composite Video signal - Colour Televisionsystems(PAL,SECAM,NTSC) - Charge Couple Device-CCD - Electronic Shutter - Video camera ACCESSORIES: Zoom lens - Microphone -Battery - AC adapter - Camera cable - Care and handling of the Equipment - Functions and Controls of Video Camera: Power on/off - VTR on/off –



Zoomcontrol - Iris Control auto/ manual/ - Viewfinder - Earphone – CameraConnector.

**UNIT V : VIDEO EDITING SOFTWARES (12 Hrs)**

Software overview (Windows Movie Maker, Adobe premiere, Pinnacle VideoStudio, Ulead Video Studio) - Video editing using Ulead Video Studio - Create video file and Disk (DVD and Blue Ray).

**BOOK FOR STUDY:**

Course material prepared by the Department.

**BOOKS FOR REFERENCE:**

1. O.P. Sharma, Practical photography.
2. Lee Forst - Hodder & Stoughton, Teach yourself Photography, U.K.
3. Video Production Handbook, Fourth EditionGerald MillersonJim Owens, Asbury College, Focal Press.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UPH530302A | | | | Title of the Paper PHOTOGRAPHY AND VIDEOGRAPHY | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 3.69 |
| CO2 | 3 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 3.62 |
| CO3 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 3.62 |
| CO4 | 4 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 3.46 |
| CO5 | 4 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 3.38 |
| CO6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4.00 |
| | | | | | | | | | | | | | Mean Overall Score | 3.62 |

**Result: The Score for this Course is 3.6 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester V** **Hours/Week: 4**
**17UPH530302B** **Credits: 4**

## Core Elective-2 (WD): BIOMEDICAL INSTRUMENTATION

**Course Outcomes:**

1. Study the function of bioelectric potentials and its importance and understand the different types of waveforms generated by organs.
2. Learn the fundamental knowledge of the electrodes to sense bio potentials.
3. Learn the basic concepts and interpretations of ECG and BP.
4. Understand the anatomy of the nervous system and its signal measurements (EMG, CAT).
5. Analyze and understand the applications of the imaging techniques transmission(x- ray and ultrasound)
6. Updating the knowledge in recent trends of measuring bio-signals

### UNIT-I: BIOELECTRIC POTENTIALS (12 Hrs)

Resting and action potentials – Propagation of action potentials – Bioelectric potentials: The electrocardiogram (ECG) – The electroencephalogram (EEG) – The Electromyogram (EMG) – Other Bioelectric potentials

### UNIT-II: BIOPOTENTIAL ELECTRODES (12 Hrs)

Electrode theory – Microelectrodes – Body surface electrodes – Needle electrodes- reference electrodes – pH electrode – Blood gas electrode – Specific ion electrode

### UNIT-III: CARDIOVASCULAR MEASUREMENTS (12 Hrs)

Electrocardiography – ECG amplifiers – Electrodes & leads – ECG Recorder principles – Measurement of Blood pressure: Indirect measurement – Measurement of Blood flow and cardiac output

### UNIT-IV: NERVOUS MEASUREMENTS (12 Hrs)

Anatomy – Neuronal communication – Neuronal Receptors – Measurements from the nervous system – Neuronal firing measurements – EMG measurements – Computerized Axial Tomography

### UNIT-V: ULTROSONIC AND X RAY MEASUREMENTS (12 Hrs)

Basic modes of transmission – Ultrasonic Imaging – Ultrasonic diagnosis – Ultrasonic transducers – Ophthalmic scans – Instrumentation for diagnosis – X rays – Special techniques

**BOOK FOR STUDY:**

1. Biomedical Instrumentation and measurements by Leslie Cromwell, Fred. J. Weibell, Erich A. Pfeiffer, Prentice Hall India, Second Edition (Pearson Education).

| Unit | Book | Sections |
|---|---|---|
| I | 1 | 3.1- 3.3,3.3.1-3.3.4 |
| II | 1 | Chapter 4 fully |
| III | 1 | 6.1, 6.1.2-6.1.4, 6.2, 6.2.1, 6.3, 6.3.1-6.3.4 |
| IV | 1 | 8.1, 8.2, 8.2.1, 8.3, 8.3.1, 8.4.2, 10.1,10.2, 10.4, 10.7, 10.7.1-10.7.3,15.4.4 |
| V | 1 | 9.2.2, 9.2.3, 9.3, 9.3.4, 14.2, 14.2.1, 14.2.2, 14.3 |



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UPH530302B | | | | | Title of the Paper BIOMEDICAL INSTRUMENTATION | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 4 | 4.0 | |
| CO2 | 5 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4.0 | |
| CO3 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 3 | 4 | 4.0 | |
| CO4 | 4 | 4 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 5 | 4 | 4 | 4.0 | |
| CO5 | 5 | 4 | 3 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 3 | 4 | 4 | 4.0 | |
| CO6 | 5 | 4 | 3 | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 3 | 4 | 4.0 | |
| | | | | | | | | | | | Mean Overall Score | | | 4.0 | |

**Result: The Score for this Course is 4.0 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester V** **Hours/Week: 2**
**17UPH540601** **Credits: 2**

**Skill-based Elective-2 (BS):**
**ELECTRICAL WIRING**

**Course Outcomes:**

1. Learn the fundamentals of electricity, electrical parameters and testing tool.
2. Understand different methods of electricity generation and types of motors.
3. Study the electrical components, symbols, types of circuits and tools
4. Study the various methods of joining conductors and electrical accessories
5. Learn the methods of wiring a house and industry
6. Hands on training on house wiring and troubleshooting the electrical circuits and appliances

**Unit-I:**

**ELECTRICITY GENERATION** **(12 Hrs)**

Fundamentals of electricity - Current, Volt, resistance - Ohm's law - Power - Kilowatt hour - Watt meter - Electrical measurements - Electric power generation by Thermal, hydro, atomic and nuclear methods - Battery - Generators - Study of Generator.

**Unit-II:**

**ELECTRIC CIRCUITS AND DISTRIBUTION** **(12 Hrs)**

Symbols of electrical parameters - Importance Series, Parallel connections - Ac and DC - Conductors - Inductor, Conductors -Inductor, Capacitor and transformer - Distribution methods - single phase and three phase - Star and delta connections - Rules of electric connections - SWG -Motors - Study of motor, series and parallel circuits.

**Unit-III:**

**ELECTRICAL WIRING - I** **(12 Hrs)**

Tools - Methods of Joining conductors - House wiring methods - Gilt, wood casing, Tough - Rubber sheathed, conduit or PVC pipe and concealed – Switches - ceiling roze - lamp holders, sockets - Fuse base - Distribution box –Trip switches - Earth connection -Experimental study of house wiring.

**Unit-IV :**

**ELECTRICAL WIRING - II** **(12 Hrs)**

Main board preparation - Distribution - Cut - out preparation - Switch board preparation - Power factor -IEE regulations - Safety precautions –



Testing the insulation -Experimental study of main, distribution and switch boards.

**Unit-V:**

**ELECTRICAL APPLIANCES** **(12 Hrs)**

Tungsten - filament bulb - tube light -mercury and sodium vapour lamp - LED lamp - heater - iron box - table fan - ceiling fan - battery eliminator - electrical requirement to washing machine and refrigerator - procedure to rectify the electrical faults in electrical appliances.

**BOOK FOR STUDY**

Course material prepared by the Department.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UPH540601 | | | Title of the Paper Skill-based Elective (BS): ELECTRICAL WIRING | | | | | | | | Hours 2/w | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 1 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 4.46 |
| CO2 | 5 | 2 | 5 | 4 | 3 | 5 | 5 | 5 | 5 | 4 | 4 | 3 | 5 | 4.23 |
| CO3 | 4 | 1 | 4 | 5 | 2 | 3 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 4.00 |
| CO4 | 4 | 1 | 5 | 5 | 2 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 4.00 |
| CO5 | 4 | 2 | 5 | 5 | 2 | 3 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 4.15 |
| CO6 | 4 | 1 | 5 | 5 | 2 | 3 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 4.07 |
| | | | | | | | | | | | | Mean Overall Score | | 4.15 |

**Result: The Score for this Course is 4.15 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester V** **Hours/Week: -**
**17UPH530212** **Credits: 2**

## Self-Paced Course: ASTRONOMY

**Course Outcomes**

1. Acquire the knowledge of solar system, Moon and eclipses, and the history behind the Lunar and Solar calendars.
2. Understand the basic ideas of motion of Moon, age, phase and rising and setting of moon, and also planets in the solar system.
3. Understand the great number of diverse phenomena used in the Astronomical Instruments and framing the various calendars.
4. Apply the scientific thinking to the real world situations by observing the solar and lunar eclipses and comparing the calendars.
5. Understand and demonstrate the astronomical telescopes and how it helps to observe the solar and lunar eclipses and planets in the solar system.
6. Apply the knowledge and to communicate the scientific information's about solar system, moon and its details, formation of eclipses, and various calendars.

**Unit-I:**

**The Moon**

Introduction – Sidereal month – Synodic month – daily motion of the moon – age of moon – phase of moon – position of moon at rising and setting.

**Unit-II:**

**Eclipses**

Introduction – umbra and penumbra – lunar eclipse – solar eclipse – duration of lunar and solar eclipse – comparison of solar and lunar eclipses.

**Unit-III :**

**Astronomical Instruments**

Sidereal clock – chronometer – gnomon – sun dual – the heliometers – the sextant – chronograph – radio telescope.

**Unit-IV:**

**Solar system**

Introduction – the Sun – Mercury - the Venus – Mars – Jupiter – Saturn – Uranus – Neptune – Pluto.

**Unit-V:**

**The Calendars**

Lunar and Solar calendars – Egyptian – Mayan – Roman – Julian and Gregorian calendars – Indian National calendar – Tamil and Malayalam calendars.

**Book for Study:**

"Astronomy" by Prof. S. Kumaravelu and Prof. Susheela Kumaravelu, revised edition 2013.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UPH530212 | | | | | Title of the Paper Self-Paced Course: ASTRONOMY | | | | | | | | Hours 2/w | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 3 | 2 | 1 | 2 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 2 | | 3.08 |
| CO2 | 4 | 3 | 2 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 3 | 4 | 3 | | 3.30 |
| CO3 | 4 | 3 | 2 | 3 | 4 | 4 | 3 | 2 | 4 | 3 | 3 | 3 | 1 | | 3.00 |
| CO4 | 3 | 3 | 1 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | | 2.84 |
| CO5 | 3 | 3 | 2 | 3 | 4 | 3 | 3 | 2 | 4 | 3 | 3 | 2 | 3 | | 2.92 |
| CO6 | 2 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 2 | 3 | 3 | | 3.15 |
| | | | | | | | | | | | | | Mean Overall Score | | 3.04 |

**Result: The Score for this Course is 3.0 (Moderate Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester V** **L P C**
**17USS540701A** **2 - 2**

**Inter Departmental Courses (IDC):**
**SOFT SKILLS**

***Course Outcomes***

1. To augment the level of confidence in articulation oif the students in their communication.
2. To ensure that the students learn to speak and interact with one another as social beings
3. To equip them and train to present the best of themselves as job seekers.
4. To equip with conversation techniques, presentation skills and grooming
5. To prepare them write their own resume and enhance their interview skills required by employers
6. To ensure that the students learn the parameters of group dynamics a key component of conversation

***Module I***

**Basics of Communication: D**efinition of communication, Barriers of Communication, Grooming, Presentations & Practicum.

***Module II***

**Resume Writing & Interview Skills:** Resume Writing: What is resume? Types of Resume - Chronological, Functional and Mixed Resume**,** Steps in preparation of Resume. **Interview Skills:** Preparation

***Module III***

**Group Discussion: Basics of G**roup Discussion, Parameters of GD, Essential Points for GD preparation, and GD Topics and Practicum.

***Module IV***

**Personal Effectiveness:** Self Discovery; and Goal Setting; Questioneers & Presentations for interview, Common interview questions, Attitude, Body Language, The mock interviews and Practicum

***Module V***

**Numerical Ability:** Calendar, Average, Percentage; Profit and Loss**,** Simple Interest, Compound Interest; Time and Work, Pipes and Cisterns; Time and Distance**,** Problems on Trains**,** Boats and Streams; Ratios and Proportions.



***Module VI***

**Test of Reasoning - Verbal Reasoning:** Series Completion, Analogy; Data Sufficiency, Assertion and Reasoning; and Logical Deduction. **Non-Verbal Reasoning:** Series; and Classification

**Textbook**

1. JASS, 2016. *Straight from the traits: Securing the soft skills*. St.Joseph's College, Trichy

**References**

1. Aggarwal, R.S. 2010. *A Modern Approach to Verbal and Non Verbal Reasoning*. S.Chand, New Delhi.
2. Aggarwal, R.S. 2001. Quantitative Aptitude. S.Chand. New Delhi
3. Covey, Stephen. 2004. *7 Habits of Highly effective people,* Free Press. Egan, Gerard. (1994). *The Skilled Helper* (5th Ed). Pacific Grove, Brooks/ Cole.
4. Khera ,Shiv 2003. *You Can Win.* Macmillan Books , Revised Edition.
5. Murphy, Raymond. 1998. *Essential English Grammar*. 2nd ed., Cambridge University Press. Sankaran, K., & Kumar, M. *Group Discussion and Public Speaking*. M.I. Pub, Agra, 5th ed., Adams, Media.
6. Trishna's 2006. *How to do well in GDs & Interviews*, Trishna Knowledge Systems.
7. Yate, Martin. 2005. H*iring the Best: A Manager's Guide to Effective Interviewing and Recruiting*.

**Evaluation Pattern**

| Modules | Topic | Examination Pattern | |
|---|---|---|---|
| | | CIA | Online |
| I | Basics of Communication | 15 | 5 |
| II | Resume Writing & Interview Skills | 15 | 5 |
| III | Group Discussion | 10 | 10 |
| IV | Personal Effectiveness | 10 | 10 |
| V | Numerical Ability (Common Session) | - | 10 |
| VI | Test of Reasoning (Common Session) | - | 10 |
| | Total | **50** | **50** |

**Semester V** **Hours/Week: 2**
**17USS540701B** **Credits: 2**

**Inter Departmental Courses (IDC):**
**NATIONAL CADET CORPS**

**Course Outcomes**

1. NCC 'C' and 'B" certificates are very much useful and increase credit marks in UPSC and SSB examinations..
2. They learnt discipline punctual and leadership quality.
3. They got physical fitness for Army and Police selection.
4. They learnt general knowledge find political issue.
5. They got trained for social service and volunteers for disaster.
6. They will be the best citizens of India.

**Unit-I: About NCC - Personality Developmet - Self Awareness** (6 hours)

NCC Aims and objectives of NCC - Organization and training and NCC song Incentives for cadets in NCC - NCC ranks Religion, culture , traditions and customs of India.- National integration – importance and necessity - Freedom struggle and nationalist movement in India - Personality development - Introduction to personality development - Factors influencing / shaping personality – Physical , social, psychological and philosophical Self awareness – know yourself / insight . - Change your mindset.

**Unit-II: Interpersonal Relationship and Communication - NDMA** (6 hours)

Interpersonal relationship and communication - Communication skills Leadership traits - Types of leadership Attitude – assertiveness and negotiation - Time management - Effects of leadership with historical examples - Stress management skills - Interview skills - Conflict motives.- Importance of group – team work - Disaster Management - Civil defence organization and its duties – NDMA Types of emergencies / natural disasters- Assistance during natural / other calamities / floods / cyclone / earth quake / accident - Setting up of relief camp during disaster Management - Collection and distribution of aid material .

**Unit-III: Social Awareness and Community Development - Hygiene and Sanitation** (6 hours)

Social awareness and community development - Basics of social service-weaker sections of our society and their needs - Health and Hygiene Structure and functioning of the human body - Hygiene and sanitation- Physical and mental health - Infectious and contagious diseases and its prevention -



Basic of home nursing and first aid in common medical emergencies - Wounds and fractures - Introduction to yoga and exercises

**Unit-IV: AIR-WING** (6 hours)

Principles of flight – Elementary Mechanics – Atmosphere - Venturi effect and Bernauli's theorem - Glossary of terms; Aero engines – Aero-engine components; Aircraft components – Airframe structure; Metereology – Importance of Metereology in Aviation; Air Navigation – Why a pilot should study Navigation; Airmanship – Airmanship; Aeromodelling – History of Aeromodelling – Materials used in Aeromodelling – Types of Aeromodels.

**Unit-V: NAVAL** (6 hours)

Naval orientation - history of Indian Navy – Navy head quarters commands fleets- ships shore establishment war ships and their role - induction to Anti submarine warfare.- Types of war ships - types anchor parts of anchor - GPS RACON RADAR - types of firewater making in the ships- NBCD organization and structure - Damage flooding.

**Text Book**

1. Cadet's hand book published by the Directorate General, National Cadet Corps, Ministry of Defence, R. K. Puram, New Delhi 110022, 2008.

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**Semester VI** **Hours/Week: 5**
**17UPH630214** **Credits: 4**

## OPTICS, SPECTROSCOPY AND LASER

**Course Outcomes:**

1. Learn the concepts of dispersion of Light , interference, diffraction and polarization of light waves and their applications
2. Study the different aberrations of lens and learn different methods of minimizing the aberrations of lens.
3. Study the principle of Microwave, Infra red, Raman and Resonance Spectroscopy and its instrumentation.
4. Understanding the physics concepts behind the mechanism of Fresnel's biprism and Michelson's interferometer.
5. Learn the working principle of Lasers, holography and their applications.
6. Should be able to associate the learning from the courses related to nanoscience , crystal growth and spectroscopy

### UNIT-I: GEOMETRICAL OPTICS (12 Hrs)

Dispersion of Light - Dispersive Power –Achromatism in prism - Deviation without dispersion - Dispersion without deviation- Constant deviation Prism- Constant deviation spectroscope- Aberration- Spherical aberration- methods of minimizing spherical aberration - Chromatic aberration of a lens - Longitudinal chromatic aberration – Lateral chromatic aberration – Achromatic combination of lenses – Conditions for achromatism of two lenses placed in contact – Two lenses separated by a finite distance - Eyepiece- Huygen's eyepiece - Ramsden's eyepiece.-Comparison of eyepieces.

### UNIT-II : PHYSICAL OPTICS (12 Hrs)

Interference - Condition for sustained interference of light - Fresnel's biprism - colors of thin films due to transmission - Michelson Interferometer and its applications. Fresnel &Fraunhofer diffraction – Fresnel's explanation of rectilinear propagation of light - Zone plate - construction - theory- Comparison of zone plate with a convex lens -Plane transmission grating - theory - Determination of wavelength of light using grating (Normal Incidence) - Polarization - double refraction -Nicol prism - Theory of Production of elliptically and circularly polarized light - Quarter wave plate - Half- wave Plate-Detection of plane , circularly and elliptically polarized light - Optical activity.

### UNIT-III: MICROWAVE AND INFRARED SPECTROSCOPY (12 Hrs)

Theory of Microwave spectroscopy - diatomic molecule as a rigid rotator- Instrumentation. IR - Range of IR radiation - theory of IR absorption



spectroscopy - theory of vibrational diatomic molecule as anharmonic oscillator - Instrumentation.

### UNIT -IV: RAMAN AND RESONANCE SPECTROSCOPY (12 Hrs)

Raman spectroscopy: Principle - characteristics and properties of Raman lines - Difference between Raman and IR spectra - quantum theory - Perkin Elemer Raman spectrometer. Resonance Spectroscopy: ESR, NMR, NQR (Principle & Theory only).

### UNIT -V: LASERS AND APPLICATIONS (12 Hrs)

Introduction - Principles of laser – Einstein's explanation for stimulated emission – Differences between stimulated and spontaneous emission - Population inversion –Properties of laser -Types of lasers - He- Ne Lasers - Semiconductor Lasers - Holography – Construction of hologram – Reconstruction of hologram - Advantages– applications of laser.

### BOOKS FOR STUDY


1. R. Murugesan, Kiruthigasivaprasath, Optics and Spectroscopy, S.Chand& Company Ltd, 8th Revised Edition. 2012.
2. Gurdeep R. Agarwal and Sham K.Anand - Spectroscopy (atomic and molecular), Himalaya Publishing House, 2004.
3. A.Marikani – Engineering physics, PHI Learning private limited ,Eastern economy edition,2012.


| Unit | Book | Sections |
|---|---|---|
| I | 1 | 1.7,1.9,1.10, 1.12, 1.13, 1.15,1.16, 1.17, 1.20,1.21,1.22, 1.25 -1.28 |
| II | 1 | 2.1,2.3,2.5,2.11,2.12,3.1,3.2,3.3,3.5,3.12,3.17,4.1,4.5,4.8,4.10,4.11-4.15 |
| III | 2 | – 2.4, 2.10, 3.1, 3.2, 3.4, 3.5, 3.9 |
| IV | 2 | - 4.6, 7.1 -7.3, 9.1 – 9.3, 10.1 – 10.6 |
| V | 3 | 2.1,2.2,2.3,2.4,2.5,2.7,2.8,2.8.2,2.8.5,2.10,2.10.1,2.10.2,2.10.3, 2.11,3.1,3.2,3.3,3.4,3.6,3.6.1,3.6.2,3.6.3,3.8,3.8.1,3.11,3.11.3. |

### BOOKS FOR REFERENCE


1. S.L. Kakni, K.C. Bhandari, A text book of Optics, S.Chand and Sons, New Delhi, 2002.
2. N. Subramanyam, Brijal. A Text Book of Optics S.Chand and Company Ltd., New Delhi.
3. B.B.Laud Lasers and Non-Linear Optics.
4. H.S. Randhawa, Modern Molecular Spectroscopy, Macmillan India Ltd.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UPH630214 | | | | | Title of the Paper OPTICS, SPECTROSCOPY AND LASER | | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 3 | 2 | 3 | 4 | 4 | 3 | 2 | 4 | 3 | 3 | 3 | 1 | 3.00 | |
| CO2 | 3 | 2 | 1 | 2 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 2 | 3.08 | |
| CO3 | 4 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 1 | 3.15 | |
| CO4 | 3 | 3 | 1 | 4 | 3 | 3 | 4 | 2 | 3 | 3 | 4 | 3 | 1 | 2.84 | |
| CO5 | 3 | 3 | 1 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2.84 | |
| CO6 | 4 | 3 | 2 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 3 | 4 | 3 | 3.30 | |
| | | | | | | | | | | | | Mean Overall Score | | 3.04 | |

**Result: The Score for this Course is 3.0 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester VI** **Hours/Week: 5**
**17UPH630215** **Credits: 4**

## QUANTUM MECHANICS AND RELATIVITY

**Course Outcomes:**

1. Understand limitations of classical mechanics and origin of quantum mechanics.
2. Ability to understand the various concepts of quantum mechanics.
3. Understand the mathematical proof of Schrodinger equation.
4. Ability to analysis and solve the Schrodinger wave equation for one dimensional systems and spherically symmetric potential problem.
5. Understand the Special theory of Relativity
6. Solving length contraction and time dilation problem

### UNIT-I: ORIGIN OF QUANTUM MECHANICS (12 Hrs)

Planck's quantum theory- particle wave duality-de Broglie concept of matter waves – expression for group velocity – relation between group and phase velocity-experimental study of matter waves - Heisenberg's Uncertainty principle – Mathematical proof of uncertainty principle for one dimensional wave packet –Properties of wave functions.

### UNIT-II: GENERAL FORMALISM (12 Hrs)

Basic postulates of wave mechanics and quantum mechanics– derivation of time dependent and time independent Schrödinger's wave equation – Probability current density – Ehrenfest's theorem- Commutator algebra – form of wave function in terms of definite momentum – probability density – properties of energy eigen values.

### UNIT-III: ONE DIMENSIONAL SCHROEDINGER PROBLEMS (12 Hrs)

Particle in a box – Infinite square well potential – potential step. The free particle – rectangular potential well- Finite square potential well. Barrier penetration problem. Linear harmonic Oscillator – Comparison of classical and quantum ideas.

### UNIT-IV: SPHERICALLY SYMMETRIC POTENTIAL PROBLEMS (12 Hrs)

Wave mechanical atom model – The hydrogen atom – normalized wave function of the Hydrogen atom – Expression for energy of the electron of the Hydrogen atom in the ground state – Significance of various quantum numbers – electron probability density –Orbital angular momentum – expression for eigen values of $L^2$ and $L_z$ – Rigid rotator.

**UNIT-V: RELATIVITY** **(12 Hrs)**

Introduction – Frame of reference - Newtonian relativity – Galilean Transformation equations – The Ether hypothesis – The Michelson –Morley experiment – Special theory of relativity – The Lorentz Transformation equations – Length contraction – Time Dilation - relativity of simultaneity – addition of velocities – variation of mass with velocity – Mass Energy equivalence – Minkowski's Four dimensional Space-Time continuum.

**BOOK FOR STUDY:**

1. R.Murugesan and Er. Kiruthiga Sivaprasath, Modern physics, S Chand & Co, New Delhi, Seventeenth Revised Edition 2014.

| Unit | Book | Sections |
|---|---|---|
| I | 1 | Chapter 9, 2.1,11.1- 11.4,11.6,11.9 |
| II | 1 | 11.7,12.1,11.8,12.2,12.6,14.4,15.5-15.7 |
| III | 1 | 11.10-11.13,12.3,12.4,14.1,16.4, 16.5. |
| IV | 1 | 11.5,11.14,13.1- 13.4,14.5,11.15 |
| V | 1 | 1.1-1.15 |

**BOOKS FOR REFERENCE:**


1. Arthur Besier, Shobhit Mahajan and S. Rai Choudhury, Concepts of Modern Physics: Mcgraw Hill Education, 7th Edition, 2015.
2. A. K. Saxena, Principles of Modern Physics, Narosa Book Distributors Pvt Ltd, 4th edition 2014.




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UPH630215 | Title of the Paper QUANTUM MECHANICS AND RELATIVITY | | | | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 4 | 2 | 3 | 4 | 4 | 5 | 2 | 2 | 3 | 2 | 2 | 3 | 3.2 |
| CO2 | 5 | 5 | 2 | 3 | 5 | 5 | 4 | 3 | 2 | 3 | 2 | 2 | 3 | 3.4 |
| CO3 | 5 | 4 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 4 | 2 | 2 | 3 | 3.7 |
| CO4 | 5 | 5 | 2 | 2 | 4 | 4 | 3 | 5 | 2 | 4 | 2 | 2 | 5 | 3.5 |
| CO5 | 5 | 5 | 3 | 3 | 5 | 5 | 3 | 3 | 2 | 3 | 2 | 2 | 4 | 3.5 |
| CO6 | 5 | 5 | 3 | 3 | 4 | 3 | 3 | 5 | 2 | 4 | 2 | 2 | 5 | 3.5 |
| | | | | | | | | | | | | Mean Overall Score | | 3.5 |

**Result: The Score for this Course is 3.5 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

**Mean Score of COs** = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$ **Mean Overall Score for COs** = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$

**Semester VI** **Hours/Week: 5**
**17UPH630216** **Credits: 4**

## DIGITAL ELECTRONICS AND MICROPROCESSOR

**Course Outcomes:**

1. Understand the structure of various number system and basic logic gates.
2. Ability to design and solve the Boolean Algebra simplification and Karnaugh Maps.
3. Develop skill to build and troubleshoot combinational digital circuits.
4. Ability to construct sequential circuits and to design counters.
5. Learn the working principle of Shift Register and its types.
6. Understand the basic of intel 8085 microprocessors architecture and its instruction set and to write assembly language programme for the intel 8085.

**Unit-1: Number Systems, Logic Gates & Boolean Algebra and K- Maps (12 hr)**

Number Systems and Logic Gates: Different Number Systems -Binary, Octal and Hexa-decimal. Conversion between the number systems. Different Digital codes – ASCII, BCD, Gray codes. Basic logic gates : AND, OR and NOT Gates. Realization using Diodes and Transistor. Universal gates - NAND, NOR - conversion into Basic gates, Special Gates – Ex-OR , Ex-NOR.

Boolean algebra and K- Maps :- Boolean Laws. De-Morgan's Theorems. Simplification of Logical expression using Boolean Algebra. Fundamental Products. Minterms and Maxterms. Implementation of a Truth Table into an Equivalent Logic Circuit by Boolean Algebra and Karnaugh Maps - 4 Variables.

**Unit-II: Combinational and Arithmetic Digital Circuits and Semiconductor Memories (12 hr)**

Data processing circuits :- A basic study of TTL, CMOS and MOSFET – Classification and parameters. Basic Idea of Multiplexers 2:1, 4:1, De-multiplexers 1:2, 1:4, Decoders, Encoders – decimal – to - BCD, Parity Generator and Checker – odd & even.

Arithmetic Circuits :- Binary Addition, Binary Subtraction using 2's Complement Method, Half Adders, Half Subtractors, Full Adders and Full Subtractors.

Memories: - Read-only memories (ROM), PROM, EPROM and RAM.



**Unit-III: Sequential Circuits (12 Hrs)**

Sequential Circuits: RS, D, JK and T Flip-Flops. Level Clocked and Edge Triggered Flip-Flops. Preset and Clear Operations. Race-around Conditions in JK Flip-Flops. Master-Slave JK Flip-Flop (As Building Block of Sequential Circuits).

Counters: Asynchronous and Synchronous Counters. Decade Counter, UP-DOWN Counters, Ring Counter.

Shift registers: - Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out, and Parallel-in-Parallel-out Shift Registers (only up to 4 bits).

**Unit-IV: Microprocessors Intel 8085 microprocessor architecture (12 hr)**

Architecture of Intel 8085. Block Diagram, different blocks, Buses, Registers, ALU, Memory- Stack Memory. Interfacing Devices, Timing and Control Circuitry, Pin-out Diagram. Timing States, Instruction Cycle, Interrupts and Interrupt Control, Input / Output. Machine Language. Assembly Language. Instruction Set and Format. Data Transfer, Arithmetic, Logical, Branching and Machine Control Operations. RIM and SIM.

Different Addressing Modes: Register, Implied, Immediate, Direct and Indirect.

Memory Organization and Addressing, Memory Interfacing, Memory Map.

**Unit-V: 8085 Instruction Set and Programming (12 Hrs)**

Microprocessor Programming: - Algorithm and Flowcharts. Simple programming Exercises : Addition – sum of two 8-bit data without carry, sum of two 8-bit data with carry, decimal addition, sum of a string of data, Subtraction of two 8-bit data, 8 bit Multiplication – using successive addition and 8 bit Division – using successive subtraction, Look-up-table, Masking of a data, block transfer.

**Books for Study:**

1. Digital Fundamentals, Thomas L. Floyd, 8th Edition (Universal Book Stall, India, 2008).
2. Fundamentals of microprocessors and microcontrollers, B.Ram, 7th revised edition, Dhanapat Rai Publications, 2011.

| UNIT | BOOK | SECTIONS |
|---|---|---|
| 1 | 1 | 2.2- 2.5, 2.8-2.11, 3.1-3.6, 4.1-4.10 |
| 2 | 1 | 11.1-11.4, 6.2, 6.5, 6.6, 6.8-6.10, 10.2-10.4 |
| 3 | 1 | 7.1-7.3, 8.1-8.4, 9.1-9.5 |
| 4 | 2 | 3.1-3.3, 4.1-4.4, 4.6, 5.2, 5.5, 7.1-7.3, 7.5, 7.6 |
| 5 | 2 | 6.1-6.6, 6.8, 6.17-6.19, 6.26, 6.27, 6.29, 6.30 |

**BOOKS FOR REFERENCE:**


1. Digital principles and Applications by Donald P. Leach & Albert Paul Malvino, (Glencoe, 1995).
2. Microprocessor Architecture, Programming, and Applications with the 8085 by Ramesh S.Gaonkar, (Prentice Hall, 2002).
3. Microprocessor Architecture, Programming, and Systems featuring the 8085 by William A. Routt, (Thomson Delmar Learning, 2006)


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UPH630216 | | | | Title of the Paper DIGITAL ELECTRONICS AND MICROPROCESSOR | | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 3 | 2 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 3 | 3.2 |
| CO2 | 4 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 2 | 3 | 3.4 |
| CO3 | 4 | 3 | 2 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 1 | 3 | 3 | 3.1 |
| CO4 | 3 | 4 | 1 | 4 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 2 | 4 | 3.2 |
| CO5 | 4 | 4 | 2 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 1 | 3 | 3.3 |
| CO6 | 4 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3.3 |
| | | | | | | | | | | | | | Mean Overall Score | 3.3 |

**Result: The Score for this Course is 3.3 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester VI** **Hours/Week: 6**
**17UPH630217** **Credits: 3**

## PHYSICS PRACTICAL - IV

**Any 16 Experiments**

1. Monostable and bistable multivibrators.
2. Spectrometer – Cauchy's constant.
3. Spectrometer – small angle prism.
4. B.G. – L by Anderson's bridge.
5. B.G. – High resistance by leakage.
6. Potentiometer – EMF of a thermocouple.
7. Potentiometer – High range voltmeter.
8. Series and parallel resonance.
9. NAND and NOR as universal building blocks.
10. Adders and Subtractors.
11. Op-amp - basic operations.
12. Astable multivibrator using Transistors.
13. Simplification of Boolean expression using k map and implementation.
14. Encoder and Decoder.
15. Binary adder and subtractor.
16. Multiplexer and Demultiplexer.
17. Flip Flops using IC gates.
18. Shift registers.
19. Counters.
20. Microprocessor – data transfer operations and exchange.
21. Microprocessor –Arithmetic operations. – 8-bit Addition, Subtraction (Binary and Decimal), 16-bit Addition only, Multiplication and Division.
22. V-I characteristics of Solar panel.

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**Semester VI** **Hours/Week: 4**
**17UPH630303A** **Credits: 4**

## Core Elective-3 (WD): COMMUNICATION SYSTEMS

**Course Outcomes:**

1. Understanding AM, FM and PM modulation and demodulation techniques
2. Learning the basic concepts of fiber optics and types of fiber
3. Understanding the basic radar system and types of radar
4. Learning the working principle of satellite communication system
5. Exposing the students to the mobile communication system
6. Studying the concept of internet protocol, wi-fi and 3G

### UNIT I: RADIO TRANSMISSION AND RECEPTION (12 Hrs)

Transmitter: Modulation - types of modulation-amplitude modulation - modulation factor-sideband frequencies in AM wave-limitations of amplitude modulation - frequency modulation-comparison of FM and AM-Demodulation-Essentials in demodulation.

Receivers: A.M. radio receivers -Types of A.M. radio receivers – Stages of superhetrodyne radio receiver-Advantages of superhetrodyne circuit -FM receiver-Difference between FM and AM receivers.

### UNIT II: FIBER OPTIC COMMUNICATION (12 Hrs)

Introduction -Basic principle of fiber optics – Advantages – Construction of optical fiber-Acceptance angle and Numerical aperture –Classification of optical fibers based on the refractive index profile – Classification of optical fibers based on the number of modes of propagation – Losses in optical fibers – Attenuation – Fiber optic communication – Advantages.

### UNIT III: RADAR COMMUNICATION (12 Hrs)

Introduction -Basic radar system -Radar range –Antenna scanning – Pulsed radar system – A Scope- Plan position indicator-Search radar- Tracking radar- Moving target indicator- Doppler effect-MTI Principle- CW Doppler Radar- Frequency modulator CW Radar.

### UNIT IV: SATELLITE COMMUNICATION (12 Hrs)

Introduction – history of satellites – satellite communication system – satellite orbits Basic components of satellite communication system– constructional features of satellites-Commonly used frequency in satellite

communication- Multiple access – communication package – antenna- power source – satellite foot points- satellite communication in India.

**UNIT V: MOBILE COMMUNICATION (12 Hrs)**

Introduction-The concept of cell –Basic cellular mobile radio system-The cellphone-Facsimile-Important features of Fax machine-Application of Facsimile – VSAT (very small aperture terminals) – Modem – IPTV (internet protocol television) –Wi-Fi-3G (Basic ideas only).

**BOOKS FOR STUDY:**


1. Metha V.K., Principles of Electronics, S. Chand & Company Ltd., 2013
2. Anokh Singh and Chopra A.K., Principles of communication Engineering, S.Chand & Company Pvt. Ltd., 2013.


**BOOKS FOR REFERENCE:**


1. Poornima Thangam I, Satellite communication, Charulatha Publications, 2012.
2. Dennis Roddy and John Coolen, Electronic Communication, PHI, 1990.
3. William C.Y. lee, Cellular telecommunication (second edition), Tata Mcgraw Hill, 1991.


| UNIT | BOOK | SECTIONS |
|---|---|---|
| I | 1 | 16.2-16.5,16.7,16.10,16.11,16.13-16.15,16.17-16.22 |
| II | 2 | 14.1-14.5.1, 14.4-14.5 |
| III | 2 | 16.1-16.6 |
| IV | 2 | 13.1-13.3 |
| V | 2 | 20.1-20.3, 20.5,20.7-20.9 |



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UPH630303A | Title of the Paper Core Elective (WD): COMMUNICATION SYSTEM | | | | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 2 | 3 | 2 | 2 | 3.1 |
| CO3 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 3 | 4 | 2 | 2 | 2 | 3 | 3.2 |
| CO5 | 3 | 3 | 2 | 3 | 3 | 4 | 4 | 3 | 3 | 4 | 2 | 3 | 3 | 3.0 |
| CO6 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 2 | 2 | 3 | 4 | 3.1 |
| CO7 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | 3.6 |
| CO8 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | 4 | 2 | 4 | 3 | 3 | 3.4 |
| | | | | | | | | | | | | | Mean Overall Score | 3.2 |

**Result: The Score for this Course is 3.2 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester VI** **Hours/Week: 4**
**17UPH630303B** **Credits: 4**

## Core Elective-3 (WD): ASTROPHYSICS

**Course Outcomes:**

1. Acquire the knowledge on the elements of space dynamics, solar system with their small bodies, universe and its neighbors and life in universe.
2. Understand the basic concepts of space dynamics, solar system: structure, activity and its features etc.
3. Understand the great number of diverse phenomena in the Universe through Physics like origin and nature of universe –subjects relevance to contemporary social issues.
4. Apply the scientific thinking to the real world problems and qualitative analysis about the solar system and their members.
5. Understand and demonstrate the formation of solar and lunar eclipses.
6. Apply the knowledge and to communicate the scientific information's about universe, solar system, and life in Mars: pre Mariner and post Mariner.

**UNIT-I: ELEMENTS OF SPACE DYNAMICS (12 Hrs)**

Man's quest for space – the energy requirements – Rocket propulsion – suborbital flights – Artificial earth satellites – Lunar and planetary probes

**UNIT-II: THE HEART OF THE SOLAR SYSTEM (12 Hrs)**

Vital statistics of the Sun – the solar photosphere – the Fraunhoffer lines – structure of solar atmosphere – the solar interior – Sunspots and solar activity – other features of the solar activity – Radio studies of the quiet Sun – Radio radiation of the distributed Sun.

**UNIT-III : SMALL BODIES IN THE SOLAR SYSTEM (12 Hrs)**

Asteroids – Meteorites – Comets as members of the Solar system – Physical properties of comets – Origin and evolution of comets – Space studies of comets – Meteors – an inventory of satellites – the large satellites – Medium, small and tiny satellites – Planetary rings.

**UNIT-IV : OUR HOME AND THE NEAREST NEIGHBOUR (12 Hrs)**

EARTH: Gross properties – internal structure – the terrestrial atmosphere – the Earth's magnetic field – motions – Solar terrestrial relations – the Earth in space – atmospheric circulation in the troposphere. MOON : Some basic facts – telescopic studies – internal structure – surface features – Origin of the Moon – the lunar environment – Solar and Lunar eclipses.



**UNIT-V: LIFE IN THE UNIVERSE (12 Hrs)**

Nature of life on Earth – A survey of objects in the Solar System – Pre Mariner search for life on Mars – Post Mariner search for life on Mars – Life outside the Solar system – the search for life in the Universe.

**BOOKS FOR STUDY**

1. Astrophysics of the Solar System – KD Abhyankar, University Press Pvt. Ltd. Hyderabad, 1999.

| Unit | Section |
|---|---|
| I | 3.1-3.6 |
| II | 4.1-4.10 |
| III | 9.1-9.11 |
| IV | 5.1-5.9, 6.1-6.6 |
| V | 11.1-11.7 |

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UPH630303B | | | | Title of the Paper Core Elective (WD): ASTROPHYSICS | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 2 | 4 | 4 | 5 | 4 | 3 | 2 | 3 | 2 | 4 | 3 | 3 | 3.38 |
| CO2 | 4 | 3 | 5 | 4 | 4 | 4 | 3 | 4 | 3 | 2 | 3 | 4 | 3 | 3.54 |
| CO3 | 3 | 4 | 5 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 2 | 2 | 3.46 |
| CO4 | 5 | 3 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | 4 | 5 | 4 | 3 | 3.77 |
| CO5 | 3 | 4 | 4 | 5 | 4 | 4 | 3 | 2 | 4 | 3 | 4 | 2 | 2 | 3.38 |
| CO6 | 3 | 2 | 1 | 2 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 3.23 |
| | | | | | | | | | | | | | Mean Overall Score | 3.46 |

**Result: The Score for this Course is 3.5 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester VI** **Hours/Week: 2**

**17UPH640602** **Credits: 2**

## Skill-Based Elective (WS): CELL PHONE SERVICING

**Course Outcomes:**

1. Understand the concepts of GSM/CDMA and to be aware of the call processing of a GSM and GPRS
2. Identify various IC's inside mobile phones and to trained to assemble and disassemble the parts of the mobile phone
3. Learn the SMT technology and soldering and desoldering
4. Understand the network problems and SIM card problems and to learn the trouble shooting process
5. Understand the IMEI information and software unlocking and flashing
6. Diagnose the problem of the mobile phone and understanding possible problem using diagnostic tools and to replacement the required modules.

**Unit-I: FUNDAMENTALS OF CELL PHONE (12 Hrs)**

Introduction to GSM/CDMA - Working of GSM/CDMA CellularTechnologies - Information of Cell Sites & Base Station -Call Processing of a GSM –Smart Phones (Android, IOS, Windows) APPs - GPRS - Mobile Software (PC suite)

**Unit-II: CHIP LEVEL STUDY (12 Hrs)**

Block Diagrams -Schematic Diagrams - Chip Level Information of Mobile Phones - BGA -SMD Reworking Station - Soldering lead -Soldering paste - De- Soldering wire - Identification of IC's - Assembling &Disassembling of Smart Phones.

**Unit-III: TROUBLE SHOOTING (12 Hrs)**

Causes for various problems & Troubleshooting of Problems in a Smart Phone - Network Problems - Display Problems –Touch Problems - Sim Card Problems – Charging problems - Battery Problems - Software Problems - IMEI information - Sim Card problems - Problems related tomobile phone handsets - replacement of Various components ICS.

**Unit-IV: PRACTICAL 1 (12 Hrs)**

Tools and Test Equipment - Disassembling the cell phone –Testing of Battery, Display, Touch, Antenna,Mic, Speaker, Ringer, Charger, Vibrator and headset - SMD soldering.

**Unit-V : PRACTICAL 2 (12 Hrs)**

Software Unlocking - User lock, SPC, MSL, FSC, OTKSL, Flashing - Downloads of logos and Ring tones - Hand set problems –Replacement of modules (display, touch screen, mic,speaker, antenna, amplifier, etc.).

**BOOK FOR STUDY -** Course material prepared by the Department.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UPH640602 | | | Title of the Paper Skill-based Electives (WS): CELLPHONE SERVICING | | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 4 | 3 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 4.3 |
| CO2 | 5 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4.3 |
| CO3 | 5 | 4 | 3 | 4 | 4 | 5 | 4 | 5 | 4 | 5 | 4 | 5 | 4 | 4.3 |
| CO4 | 5 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 5 | 4 | 5 | 4 | 5 | 4.4 |
| CO5 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 3 | 3.8 |
| CO6 | 5 | 4 | 4 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4.3 |
| | | | | | | | | | | | | Mean Overall Score | | 4.2 |

**Result: The Score for this Course is 4.2 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling*:**

| **Mean Score of COs** = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$ | **Mean Overall Score for COs** = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$ |
|---|---|